

YALE MEDICAL LIBRARY



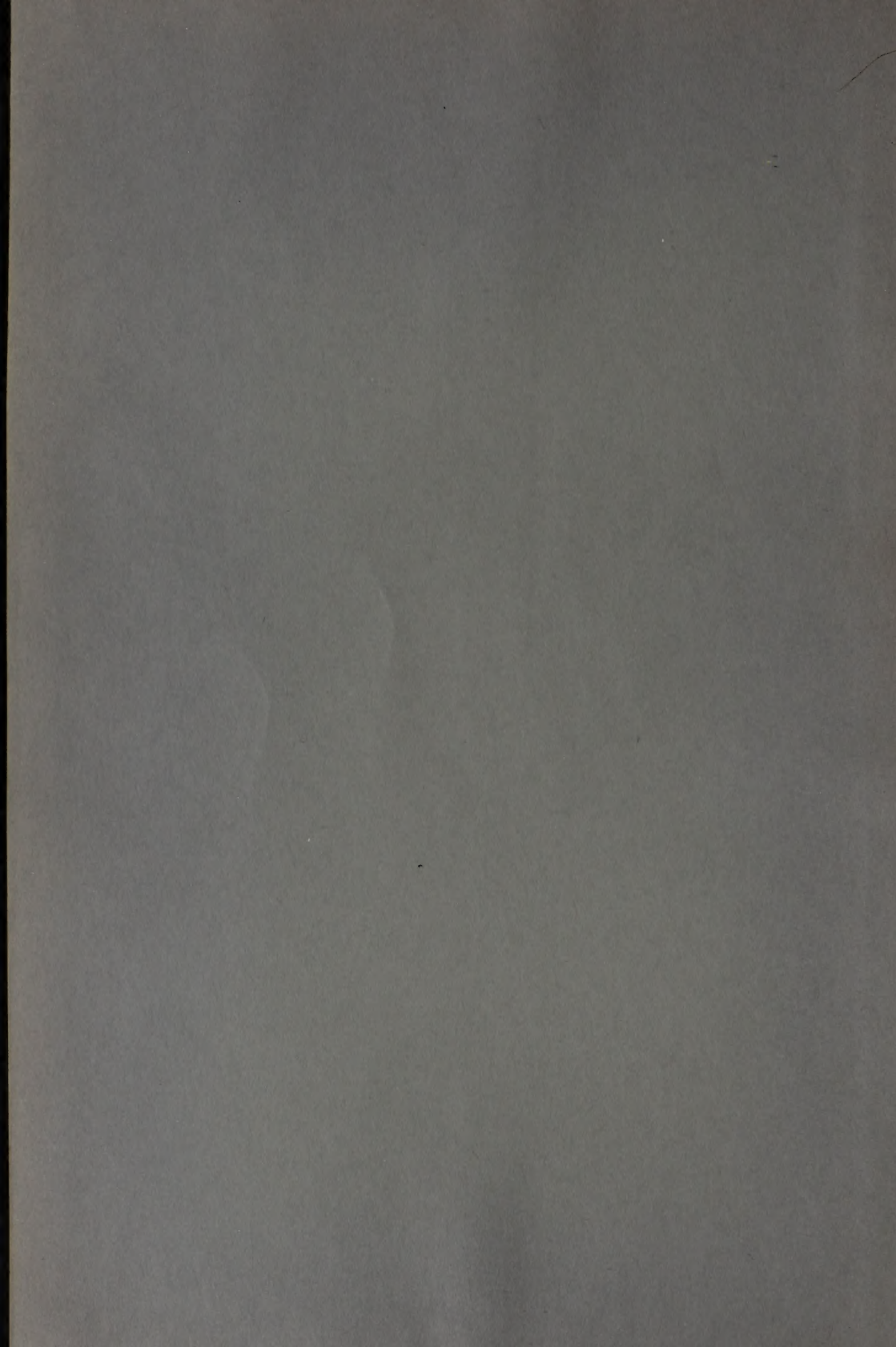
3 9002 07959 4918

YALE UNIVERSITY
LIBRARY



LIBRARY OF
THE SCHOOL OF
MEDICINE

Section on Odontology
Carnegie Foundation Fund



THE DENTAL COSMOS

A MONTHLY RECORD
OF DENTAL SCIENCE

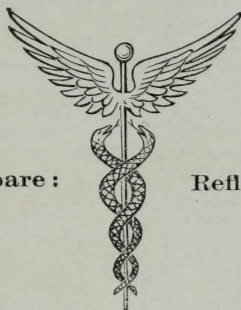
Devoted to the Interests of the Profession

EDITOR

EDWARD C. KIRK, D.D.S., Sc.D., LL.D.

ASSOCIATE EDITOR

L. PIERCE ANTHONY, D.D.S.



Observe : Compare :

Reflect : Record.

VOLUME LXI.—1919.

PUBLISHED BY

THE S. S. WHITE DENTAL MANUFACTURING CO.

211 SOUTH TWELFTH STREET, PHILADELPHIA.

1919.

CONTENTS OF VOLUME LXI.

1919.

First pages of monthly issues:

PAGE	PAGE	PAGE	PAGE
JANUARY 1	APRIL 275	JULY 607	OCTOBER 929
FEBRUARY 97	MAY 361	AUGUST 711	NOVEMBER ..1059
MARCH 193	JUNE 449	SEPTEMBER ...819	DECEMBER ..1169

ORIGINAL COMMUNICATIONS.

Application of Engineering Principles to the Predetermination of Arch Outlines	11	Dentist (The) and the Recent Influenza Epidemic	299
Application of Surgery as One of the Four Basic Principles of Oral Restoration	59	Diagnosis and Treatment of Oral Infections	726
Artificial Feeding and Its Bearing on General Disturbances and Malocclusion of the Teeth	97	Diseases of the Dental Pulp:	
Biologic Aspect (The) of Periodontia ..	853	(I) Diagnosis	308
Business System in Connection with Office Practice	1078	(II) Etiology	382
Capillary Attraction in the Treatment of Root-canals	119	(III) Classification	385
Case Report Showing the Value of the Radiograph as a Protective Factor in Dental Practice	486	(IV) Treatment	641, 718
Chloramins in the Treatment of Pyorrhea	1218	Electrobiolytic Theory of Dental Caries ..	21
Clinical, Roentgen, and Microscopic Diagnosis of Dental Conditions	742	Erythrophlein Hydrochlorid as an Agent for Devitalizing the Dental Pulp	296
Concerning Gold Inlays	629	Extraction vs. Treatment	724
Consideration of Some Lesions of the Oral Cavity from the Viewpoint of Their Relationship to Systemic Infection, and the Technique for the Administration of Conduction Anesthesia for Their Surgical Removal ..	711	Failures and Accidents with Mandibular Injections	275
Considering the Wax Pattern	204	Foundation Principles in the Mechanism of Speech and the Importance of Training the Speech of Cleft-palate Patients After Operations	134
Contribution to the Morphogeny of the "Dens in Dente"	224	Gold Three-tooth Molar Bridge Removed from the Right Bronchus: Case Report	945
Critical Consideration of Dr. G. V. Black's Method of Making and Testing Dental Amalgam Alloys	735	Histo-pathology of the Jaws and Apical Dental Tissues:	
Dakin's Solution in the Treatment of Pyorrhea	489	(I) Bone Absorption Around the Roots of Teeth	361
Davis Crown Technique	1222	(II) Abnormal Collateral Arterial Development in the Roots of Teeth ..	827
Dental Broach in the Bronchus: Report of a Case	201	(III) Epithelial Débris Located in the Peridental Membrane and Other Structures	929
Dental Electro-Diagnosis	122	(IV) Degenerated Root Structures ..	1067
Dental Legislation for the Elimination of Malpractice in Dentistry	859	(V) Development of the Peridental Membrane	1213
Dentistry and the Public	218	Honesty and Harmony in the Dental Profession	213
		Importance of the Dental Assistant and a Method of Training Her	1085
		Impression Filler, Surfacers, and Separator	493
		Is the Endamœba Buccalis the Real Cause of Pyorrhea?	981
		Light and Lighting for Dentists	845

Litmus as an Indicator of the Salivary Reaction	409	Report of an Unusual Case of Third Molar Impaction with Complications	111
Mankind's Greatest Benefactor	28	Report of Committee on Dental Science and Literature (Pennsylvania State Dental Society)	633
Mental Myopia vs. Public Sanitation ..	317	Report of Committee on Practice—Dental Society of the State of New York	947
Modern Tendencies in Bridge Work	1169	Report of Five Years of Mouth Hygiene in the Public Schools of Bridgeport, Conn.	607
Multiple Infection: A Study of Relationship Between Infections	1059	Report of Several Cases of Grave Systemic Disturbance Doubtless Caused by Pathological Conditions of the Dental Organs	216
Myristica (Nutmeg) in the Treatment of Pyorrhea Alveolaris Associated with the Parasitic Endamœba	295	Report of the Oral Hygiene Inspector, University of the State of New York	870
New Bridges for Old	211	Report on Dental Science and Literature (Mississippi Dental Association) ...	52
New Species (A) of Dentist: Do We Want It?	1205	Report on Dental Science and Literature for the year 1918. (Missouri State Dental Association)	976
New System of Dental Radiography ..	862	Retracting and Suturing of Soft Tissues with Regard to Extraction of the Impacted Lower Third Molar	1092
Novocain Infiltration Anesthesia in the Everyday Practice of Dentistry	303	Root Amputation	649
Oral Foci of Infection from a Dentist's Standpoint	1183	Root Resection	41
Oral Prophylaxis in Its Relation to Preventive Dentistry	473	Root Resection: A Plea for a Broader Field	388
Oral Surgical Cases in Practice	942	Seventeenth Century Dental Instruments	861
Pain Following Local Anesthesia	407	Sinusitis: Its Relation to Abscessed Teeth	752
Passing of the Mucous Patch and Its Congeners	301	To What Degree are Oral Pathological Conditions Responsible for Systemic Disease?	33
Plastic Surgery and Auricular Prosthesis	480	Treatment of the Army Dental Patient	292
Plea (A) on Behalf of American Dentistry	222	Treatment of Ununited Fractures of the Jaws: <i>Résumé</i> of Work Done by Dental Dep't, U. S. Army Gen. Hosp. No. 11, Cape May, N. J.	455
Post-operative Pain Control	985	Trench Mouth and Its Treatment	66
Practicable Root-canal Technique. I: Introduction	1193	Ultero-membranous Gingivitis, the Gingival Phase of Vincent's Disease	819
Practical Use of the Dental Radiograph ..	965	Use of Hypochlorites and Chloramins in Dentistry	373
Present Status of Teeth Without Vital Pulp	626	Use of Orthodontic Appliances in the Treatment of Fractures of the Mandible and Maxilla from War Casualties	128
Principles Involved in Interchangeable Dental Splints with Attachment for Extra-facial Tension in Maxillo-facial Surgery	839	War and the Dental Profession (Correspondent's Report, Dental Society of the State of New York)	866
Pseudo-Hemophilia	648	What Constitutes Reinfection of Root-canals, and How Can It be Prevented? ..	955
Pyorrhea and Autogenous Vaccines	1094		
Question (A) of Inter-professional Ethics	1088		
Radicalism	1190		
Radical Treatment of Focal Infections from a Military Point of View	193		
Relative Value of Gold Foil as a Filling Material	971		
Relation of Dental Affections to Systemic Diseases	619		
Removable Retainer (A)	449		
Report of a Case of Acute Leukemia ..	725		
Report of a Case of Impacted Third Molar Extracted Under Infiltration Anesthesia	1223		

Papers in Society Proceedings.

Dental Clinic (The) and the Public Schools	1016	President's Address (Maryland State Dental Association)	1006
Interpretation of Radiographs as a Basis for Oral Surgical Procedures	759	President's Address (Pennsylvania State Dental Society, 1918)	147
Oral Hygiene and Public Instruction Throughout the State of New York ..	1128	President's Address (Pennsylvania State Dental Society, 1919)	1099
President's Address (Dental Society of the State of New York)	875	Relation of the Dental Condition to Child Development	1116

CORRESPONDENCE.

Benzoic Acid a Valuable Antiseptic and Devitalizer of Bacteria	1224	Dentist of the American Red Cross Military Hospital No. 15, at Auteuil	70
Case (A) from Practice	986	Instance (An) of Fourth Molar	1096
Checking of Gum Blocks	412, 660	Notable Concession (A) to Dentistry in Japan	659
Dental Broach in the Bronchus	413, 661	Odd Simulation (An) of Lingual Palsy	145
Dental Care in Pregnancy	660, 874	Painless Pulp Extirpation	69, 231
Dental Clinic in the National Army Cantonment	228	Procain Anesthesia	67
Dentist or Stomatologist?	68	Poem—A Tribute to Dr. Jas. McManus	892
Diet and Teeth of the Natives of Turks Islands, British West Indies	230	Pulp Testing	143
Double-rooted Canine (A)	412	Relation of Caries to Pyorrhea; Symmetrical Caries	144, 320
Failure in Apicoectomy	661	Reply to "Why Not 'Chinese' Silver?"	319
Fractured Roots Remaining in the Jaw	69, 231	Trench Mouth and Its Treatment	233
<i>Illustration</i> —A Dental Anomaly: Three Lower Right Third Molars	774	Trouble (A) in the Casting of Gold Inlays	70, 145, 232
<i>Illustration</i> —American Red Cross: The		Ultero-membranous Gingivitis	1095

PROCEEDINGS OF SOCIETIES.

Academy of Stomatology of Philadelphia	234, 767	Eastern Association of Graduates of the Angle School of Orthodontia	163
Campaign to Enlist the Co-operation of the Dental Profession in the Fight Against Venereal Diseases by the Bureau of the Public Health Service, Washington, D. C.	1132	"Forsyth Day" at the Forsyth Dental Infirmary	668
Dental Society of Chester and Delaware Counties: Addresses at annual dinner (in honor of Dr. Jesse C. Green)	321	Forsyth Training School for Dental Hygienists	1253
Dental Society of the State of New York 875, 987, 1116, 1236		Maryland State Dental Association, 1006, Missouri State Dental Association	1249, 1015
		Northeastern Dental Association	754
		Pennsylvania Association of Dental Surgeons	662, 883
		Pennsylvania State Dental Society 146, 1097, 1225	

EDITORIAL.

<i>Audi Alteram Partem</i>	1255	Preventive Dentistry and the Dental Hygienist	241
Bridgeport Demonstration (The)	670	Re-vival (The) of Dental Prosthesis	172
Dental Education of the Public	1026	Specialization in Dentistry	775
Dental Lesson of the War	414	Transactions of the Inter-Allied Dental Congress, Paris, 1916	1151
Dental Movement (The) in Great Britain	494	Vanderbilt University School of Dentistry	897
Dentistry for the Masses	893	Venereal Disease and the Public Health	1149
Instance (An) of Fourth Molar	1096	Victory Liberty Loan (The)	333, 418
<i>Journal of the Allied Dental Societies</i> Ceases Publication	246	Wonderful Year (The)	71
Local Anesthesia in Dentistry	329		
Passing (The) of the <i>Dental Review</i>	176		

BIBLIOGRAPHICAL.

Condensed Chemical Dictionary (The)	1152	Textbook (A) of General Bacteriology	335
Introduction to the Mammalian Dentition	78	Transactions of the Sixth International Dental Congress	1030
Normal and Pathological Histology of the Mouth	75	Tube Teeth and Porcelain Rods	673
Surgery of Oral Diseases and Malformations, Their Diagnosis and Treatment	74	<i>Books Received</i>	335, 674, 1031

PRACTICAL HINTS, ETC.

Abcessed Teeth Can be Restored to Usefulness	677	Removing Mercury Stains from Gold Crowns	678
Benzoic Acid a Valuable Antiseptic and Devitalizer of Bacteria	898	Removing Steele's Facings from an Old Bridge	677
Case (A) of Exostosis	780	Report of a Case of Emphysema	781
Contouring Synthetic Fillings	676	Safe Way for Using a Separating Disk	81
Easy Method of Applying Iodin	80	Soldering Without Pits	676
Economy in the Use of Fissure Burs ..	177	Suggestions to Beginners in the Use of Novocain Conduction Anesthesia	678
Fitting a Backing to a Tooth	781	"Teaser" (A) for Gold Soldering	336
Immediate Plate Repair	1258	Treatment of Trifacial Neuralgia by Alcoholic Injections	679
Inlay Restoration of Incisal Corners ..	499	Use of the Matrix as an Aid in Contouring Anterior Teeth with Gold Foil ..	81
Novocain-Adrenalin Stock Solution ..	675	Why Facings Break, and a Method of Prevention	499
Preventing Corrosion of Metal Syringe Tripods	1258	X-ray (The) as a Positive Diagnostic Aid	336
Reclaiming Used Wax	679		
Removal of Redundant Gum Tissue Prior to Insertion of Full Upper and Lower Dentures	899		

REVIEW OF CURRENT DENTAL LITERATURE.

Abnormal Conditions of Enamel in Cases of Malnutrition	181	Comparative Values of Some Local Anesthetics	501
Absorption of Premaxilla in Tertiary Syphilis of Nose	419	Complement Fixation Tests as Applied to Dental Practice	1034
Action of Chlorinated Antiseptics on Blood-clot	255	Complications of Vincent's Infection of the Oral Mucosa	338
Acute Necrotic Parotitis	1260	Concerning the Action of Local Anesthetics on Striated Muscle	785
Acute Ulcerative Gingivitis	180	Congenital Malformation of the Left Temporo-maxillary Joint and Both Hip Joints	84
Anatomical Demonstration of the Triple Origin of Human Incisors	85	Contribution to the Knowledge of the Development of the Submaxillary and Sublingual Glands in Human Embryos ..	1261
Ankylosis of Jaw	903	Contribution to the Study of Human Enamel, with Special Reference to Its Nutrition	423
Antiseptic Action of Benzyl Alcohol ..	339	Correlation Between Mental Defect and Anomalies of the Hard Palate	904
Bacterial Flora of Mouth and Nose of Normal Horses	423	Cure of Neuralgia Under Fixation Abscess	1259
Bacterial Toxin as a Cause of Retinal Hemorrhage	254	Daily Hygiene of the Mouth: Its Prophylactic Importance During Epidemics	421
Bacteriological Control of Dental Procedures	685	Dead Teeth	340
(A) Band and Lingual Arch Technique. (B) The Removable Lingual Arch as an Appliance for the Treatment of Malocclusion of the Teeth	247	Dental Conditions at an Ante-natal Clinic	1156
Bilateral Syphilitic Parotitis with Facial Paralysis of the Left Side	1262	Dental Infection and Eye Diseases	181
Bone-grafting in Fracture of the Mandible	345	Dental Infections in Children	1155
Cancer of the Oral Cavity, Jaws, and Throat. Treatment by Electro-thermic Methods or in Combination with Surgery, the Roentgen Ray, and Radium, with an Analysis of 200 Cases So Treated	252	Dentistry and the Nation	1031
Cancer of the Tongue	343	Dermoid Cysts Lying Within the Floor of the Mouth: Report of Two Cases ..	685
Case of Hypopituitarism	83	Diagnosis and Treatment of Basal-Cell Epithelioma	252
Case of Multiple Epulides	1157	Diastemia in Its Relation to the Pathogenesis of Dental Caries and to Variations in Cuspal Topography	1156
Case of Pyorrhea Alveolaris Treated by Emetin	87	Displacement of the Mandibular Meniscus, and Its Treatment	337
Cases of Hereditary Dental Pigmentation	684	Does Normal Saliva Contain Uric Acid (Urate)?	425
Clinical Observations Concerning Malignant Tumors of the Jaws	249	Elimination of Potassium Iodid in the Urine and Saliva	1154
Clinical Picture of Streptococcus Viridans Infection	684		

Enlarged Thyroid Due to Impacted Third Molar	1263	Ocular Syndrome of Dental Origin	1036
Etiology of Lichen Planus	179	One Hundred Cases Treated with Autogenous Vaccine	345
Experimental Studies on Pyorrhea Alveolaris	504	Operable Tumor (An) Involving the Gasserian Ganglion	86
Eye Color and the Abnormal Palate in Neuroses and Psychoses	1259	Operative Treatment of Hare-lip and Cleft Palate	338
False Teeth as a Cause of Cancer	345	Operative Treatment of Trifacial Neuralgia	1263
Fistula of Parotid in War Wounds of the Face and Jaws	782	Oral Surgery in Egypt During the Old Empire	900
Focal Infection and Chronic Urticaria	1155	Orthodontic Appliances and Gingival Tissue	683
Focal Infection as a Cause of Painful Heel	1259	Osseous Demineralization and Its Treatment	503
Food Deficiencies as a Factor Influencing the Calcification and Fixation of the Teeth	786	Osteogenesis	784
Foreign Bodies in Air and Food Passages	337	Paralysis of the Sixth Cranial Nerve Associated with Otitis Media (Gradenigo's Syndrome or Triad)	87
Formation of Bone	783	Parotitis as a Complication of Influenza	420
Gingival Septico-Pyemia	180	Parotitis as a Post-operative Complication	425
Hemolytic Streptococci in the Faucial Tonsil, and Their Significance as Secondary Invaders	421	Peculiar Affection of the Maxillary Incisors	422
Impacted Fourth Molar	681	Perithelioma of Right Maxillary Antrum: Radium Treatment	1263
Infantile Scurvy	341	Perverted "Functional" Activity in the Production of Jaw Deformities	1153
Influence of Diet on Teeth Formation	246	Post-operative Parotitis	424
Intra-oral Skin Grafting: The Establishment of the Buccal Sulcus	784	Preliminary Report on the Behavior of Certain Local Anesthetics	342
Itinerant Dental Instructors	783	Preliminary Study of the Effect of "Rickets" on the Jaws	1032
Jaw-winking Phenomenon and Its Explanation	1035	Process (The) of Resorption Occurring in Teeth in Dermoid Cysts	342
Labial and Lingual Cancer in Animals	502	Pyemia as a Sequel to Mandibular Fracture Due to Tooth Extraction	250
Leptothrix asteroidis	501	Radicular Odontome from the Upper Quaternary	903
Lichen Planus of the Mucosa and Leukoplakia	905	Reflex Convulsions During Dentition ..	87
(1) Lingual Lipoma—Case, and (2) Multiple Oral Malformations	86	Relation Between the Periphery of the Cranium and the Form of the Dental Arch	84
Lingual Decortication for Leukoplakia under Local Anesthesia	420	Relationship of Focal Infection to Certain Dermatoses	179
Local Anesthesia in Children	902	Relative Irritant Properties of the Chlorin Group of Antiseptics	250
Lymphatics of the Dental Region	82	Roentgenographic Studies of Tissues Involved in Chronic Mouth Infections ..	251
Mandibular Fracture, Curing Spontaneously, from the Polished Stone Epoch	903	Rôle of Focal Infections in the Psychoses	423
Melanotic Sarcoma or Melanoma of Superior Maxilla	786	Sialophagia of Central Origin	83
Microscopic Appearances of Ulceromembranous Tonsillitis (Vincent's Angina)	903	Saliva (The) in Pellagra	785
Microscopic Studies of Diseased Peridental Tissues	83	Secondary Syphilitic Periosteitis of Mandible: Report of Case	1157
Mottled Enamel: A Further Consideration of an Endemic Artesian District in Virginia, Together with Data Relative to the Brava People, Cape Verde Islands	685	Some Biological, Physiological, and Clinical Problems in the Treatment of Oral Septic Foci	339
Mouth Infections as a Source of Systemic Disease	179	Some Influences of Diet Affecting the Second Dentition	1260
Movement of Eyelid Associated with Mastication	501	Spasm of Accommodation with Disturbance of Ocular Movements, of Dental Origin	1154
Multiple Infections: A Study of the Relation of One Infection to Another ..	182	Staphylococcemia Simulating Typhoid Fever with Relapses	1260
New Departure (A) in the Construction of Obturators	88	Streptococcus Oral Sepsis	1034
Normal and Pathologic Cytology of the Submaxillary and Parotid Salivas ..	1156	Studies in Paleopathology	251
Note on a Deformed Skull from Sivash Oasis	901		
Occurrence of Bacillus Influenzæ in Throats and Saliva	421		

Studies on the Amyolytic Activity of Human Saliva with a New Method ..	344	Tooth Plates Impacted in the Esophagus	500
Study (A) of Atypical II Pneumococci	421	Treatment of Acute Septic Gingivitis..	180
Study of Blood-Pressure Changes During Nitrous Oxid-Oxygen Anesthesia.	1155	Treatment of Essential Facial Neuralgia by Local Alcoholization	249
Study of Some of the Etiological Factors Bearing on the Therapeutics of Bell's Facial Palsy	344	Treatment of Malignancy in the Mouth and Throat by Radium	252
Suppurative Gingivitis with Alveolar Involvement: A New Surgical Procedure	84	Treatment of Malignant Disease by Combined Methods	342
Syphilis as a Factor in Buccal Leukoplakia	1033	Treatment of Neuralgia of the Fifth Nerve by Injection of the Gasserian Ganglion	254
Technique of Gasserectomy	904	Treatment of Tumors of the Upper Jaw with Cautey	341
Technique of Pyorrhea Treatment with Medicated Pastes	82	Trigeminal Paralysis	421
Teeth and Tonsils as Causative Factors in Arthritis	177	Trophic Lesions of the Face	420
Three Signs of Some Value in the Diagnosis of Unusual Cases of Influenza..	420	Tuberculosis of Maxillary Sinus	502
Thyroid Hormone and Its Relation to Other Ductless Glands	182	Use of Blood Agar for the Study of Streptococci	681
Tic Douloureux with Special Reference to Treatment by Alcohol Injection ...	503	Use of Hypochlorites and Chloramins in Dentistry	85
		Vertigo and Focal Infection	905
		Vincent's Angina	504, 680
		Work of the Department of Health's Dental Clinic for School Children ..	1032

PERISCOPE.

Adaptation of Gold Foil to Cavity Walls	687	Chronic Fistula from a Buried Deciduous Tooth	1157
Advantages Claimed for Removable Bridge Work with Cast Clasps	506	Churchill's Tincture of Iodin	257
Advantages of Nerve Blocking by Conduction Anesthesia	1265	Cleaning Teeth	1158
Advantages of Removable Over Fixed Bridge Work	91	Consideration for the Patient	255
Amycain	505	Contour of the Arch	183
Anatomical Articulator (The)	183	Correcting Articulation	1264
Anesthesia in the Reduction of Fractures	256	Crowns as Used by Spies	505
Anesthetics in Dentistry	907	Cyanosis in Nitrous Oxid Anesthesia ..	426
Aphthous Stomatitis	787	Death of Mr. Fletcher	688
Apothesin Anesthesia	256	Dental Broach Swallowed	1038
Arch Form	1265	Dental Deficiency During Pregnancy ..	1160
Articulator for Crown and Bridge Work	789	Dental Education	1266
Asepsis in Filling Root-canals	908	Dental Examination a Requirement of Employment	1158
Backing for Steele Facings	906	Dental Hygienist (The)	908
Bone Spatulas	89	Dental Hygienist Legislation	688
Brief Directions for Conduction Anesthesia: Anatomic Landmarks, etc. ..	348	Dental Treatment for Mothers	689
Broken Nerve Broaches	905	Dichloramin-T: Points in Use	347
Burning Out the Wax from a Casting Investment	688	Directions for Brushing the Teeth ...	90
Callahan's Method of Root-filling	347	Diseased Pulp	505
Cancer of the Mouth	505	Duplicating Plaster Casts	686
Care of Deciduous Teeth	257	Early Recognition of Tumors in the Mouth	426
Care of Teeth and Mouth During Pregnancy	689	Efficiency of Various Antiseptics and Germicides	690
Case of Antral Abscess Treated with Salicylic Acid	255, 787	Essentials of a Practical Articulator ..	907
Case of Cancer of the Pericementum ..	428	Extraction of Impacted Third Molar ..	506
Case of Dentigerous Cyst in Connection with Third Mandibular Molar	788	Face-bow (The)	1038
Case of Iritis Due to Third Molar Impaction	789	Few Precautions (A) in Conduction Anesthesia	346
Casting in Cold Molds	686	Finishing Amalgam Fillings	906
Cavity Preparation for Cast Inlays ..	1265	Fixed or Removable Bridge Work	346
Cementing Steele Facings	687	Focal Infections and Systemic Diseases	184
		Fractures Complicated with Abscesses..	257
		Gingival Shrinkage in Gold Inlays	259
		Gold Foil Fillings	184
		Gold Inlay: Indirect Method	1159
		Gold Inlays	89

Hard Plaster-of-Paris Casts	426	Pyorrhea Alveolaris	89
How to Clean Chamois Skin	506	Quick Filter (A)	1158
How to Drill Cavities in Porcelain Teeth	505	Radiograph (The) and Infectious Areas	184
How to Prevent Inaccuracy While Setting Up Teeth	183	Radiography and Orthodontia	1037
How to Prevent Decay of Children's Teeth by Attention to Diet	90	Record of Vaccination	1037
How to Protect Synthetic Cement Fillings from the Saliva	89	Regeneration of the Mandible	689
Importance of Properly Reproducing the Occlusal Surfaces	905	Relation of Teeth to the Ridge in a Lower Denture	1038
Impression Cup Technique	906	Removal of Rust from Steel Instruments	1264
Indications for Use of Gold as a Base for Artificial Dentures	256	Repairing a Broken Facing	255
Indications for the Use of Nitrous Oxid Anesthesia in Extracting	91	Repairing Vulcanite Dentures	183
Inflammation	185	Resilient Teeth	348
Interpretation of Radiographs	257	Restoring Lost Margins in Inlays	687
Iodid of Starch as an Antiseptic for Wounds	347	Root-canal Operations	258
Karat of Gold Used in Casting	688	Root-canals and Bridge Work	348
Large Teeth and Small Jaws	258	Root Resection	507
Limitations of the Radiograph in Diagnosing Dental Lesions	183	Rural Dental Clinic	346
Matrix for Boxing the Impression	787	Scientific Aspect of Removable Bridge Work	689
Matrix for Porcelain Inlays	427	Securing Canal Broaches	906
Method of Firm Attachment of Vulcanite to Aluminum Dentures	1037	Selectivity of Organisms	908
Method of Making an M. O. D. Inlay ..	1037	Setting Crowns and Bridges	347
Metric System (The)	687, 1264	Setting of Small Inlay Bridges	1037
Most Effective Styptic (A)	89	Simple, Accurate Technique for Making Gold Saddles	90
Mounting Dental Films	1264	Softening the Automatic Mallet Blow..	905
Municipal Appropriations for Free Dental Clinics	1265	Soldering	905
Nesbitt Removable Bridge: Modified Technique	1159	Some Advantages of the Indirect Method of Making Inlays	184
Nitrous Oxid-Oxygen Anesthesia for Difficult Extractions	506	Standardizing the Color of Teeth by the Classification of People into Types and Classes	788
Notes of a Peculiar Case of Emphysema	348	Stippling the Pink Vulcanite	686
Number of Bacteria in the Mouth	687	Strength of Epinephrin for Local Anesthesia	1038
One-piece Backing for Steele's Facings	787	Supernumerary Teeth	89
Oxid of Zinc and Oil of Cloves	259	Suprarenin in Combination with Novocain	687
Passing a Strip Through a Tight Contact	255	Surgery in Edentulous Mouths	788
Patient (The) as a Factor in Anesthesia	185	Swaging with Moldine	905
Personal Experience with Lane's Plate in Fractures	1036	Systemic Conditions and the Teeth	258
Pharmacology of Local Anesthetics	1158	Technique of Administration of Nitrous Oxid and Oxygen to Children	1039
Plate Polishing	1264	Technique of Plaster Impression-Taking	428
Polishing Vulcanite Work	686	Technique of Root-resection	429
Position of the Contact Point	256, 1039	Technique of Wiring Corresponding Teeth of Superior and Inferior Maxilla in Fracture of Inferior Maxilla..	1038
Post Protection in Difficult Cases	1264	Tempering Explorers	89
Preparation of the Mouth in Cases of General Anesthesia	906	Tonsil Infections	906
Preparation of the Tooth for a Jacket Crown	1266	Tragedies of the Profession	789
Problem of Articulation	690	Treatment of Non-Vital Teeth	428
Process of Bone Repair in Fracture of the Jaws	91	Treatment of Putrescent Teeth	427
Pulp Capping	507	Treatment of Superficial Gingivitis	427
Pulpless Deciduous Teeth	346	Ulcerative Stomatitis	259
Pulp Protection	346	Vomiting and Nausea under Anesthesia	907
Pulp Removal	506	Vulcanite Tooth Replacement	426
		Washing Amalgam	89
		What is "German Silver"?	255
		X-ray (The) in Dentistry	907
		Zinc Oxid and Oil of Cloves	90

OBITUARY.

Thomas G. Aller	92,	187	Newell Sill Jenkins	1160,	1267
Joseph L. Bellefleur		351	A. E. Matteson		1162
Vance W. Bliss		508	John Henry Meyer		186
Carl S. Briggs		352	Max Neal		1041
Arthur W. Browne		691	Arthur V. Prentis		909
Wm. Rabun Chaplin		508	George L. Primrose		910
Michael J. Collins		790	James E. Quinn		1267
Geo. Cunningham		430	Wm. Angus Ray		350
John F. Dowsley		909	Arthur A. Rehm		186
Deran G. Gairdan		262	Edward Rowan		262
Thomas J. Giblin		432	James G. Templeton		430
Nathaniel Gildersleeve	1257		Alfred F. Tilly		1267
Simeon H. Guilford		260	Chas. King Van Vleck		1040
Edw. M. Guthrie		187	John Andrews Watling		351
Harry Stewart Haslett		790	Chas. Dudley Winsor		432
J. C. Higgins		262	Otto Zsigmondy		1162

DENTAL LEGISLATION AND LEGAL DECISIONS.

Amendments to the Dental Law of Tennessee	692	Legal Opinion on Section of Illinois Dental Law Relating to Registration of Licenses	1042
Child Oral Hygiene in New York	911	Maine Dental Law Providing for Dental Hygienists [as amended]	509
Committee Report on Dental Service in Great Britain	525	New Dental Law of Minnesota	791
Final Decision in the Carr Case	1263		

DENTAL COLLEGE COMMENCEMENTS.

Atlanta-Southern Dental College	697	New York College of Dentistry	802
Baltimore College of Dental Surgery ..	804	North Pacific College, School of Dentistry	807
Baylor University, Dental Department ..	697	Northwestern University, Dental School ..	805
Chicago College of Dental Surgery	801	Ohio College of Dental Surgery	916
Cincinnati College of Dental Surgery ..	694	Philadelphia Dental College (Temple University)	806
College of Dental and Oral Surgery of New York	917	Philippine Dental College	1044
College of Physicians and Surgeons of San Francisco	796	Royal College of Dental Surgeons	698
Columbia University, Dental Department	800	St. Louis University, School of Dentistry	808
Creighton University, Dental Department	797	Thomas W. Evans Museum and Dental Institute School of Dentistry University of Pennsylvania	798
Dalhousie University, Dental Department	795	Tufts College Dental School	914
Georgetown University, Dental Department	1046	Tulane University, School of Dentistry ..	696
George Washington University, Dental School	805	University of Buffalo, Dental Department	1045
Harvard Dental School	806	University of California, College of Dentistry	806
Howard University, Dental College	696	University of Illinois, College of Dentistry	804
Indiana Dental College	1046	University of Iowa, College of Dentistry ..	913
Kansas City Dental College	1045	University of Louisville, College of Dentistry	803
Laval University, School of Dental Surgery	697	University of Maryland, Dental Department	797
Loyola University, School of Dentistry ..	1044	University of Michigan, College of Dental Surgery	807
McGill University, Department of Dentistry	696	University of Minnesota, College of Dentistry	915
Marquette University, School of Dentistry	796	University of Nebraska, College of Dentistry	695
Medical College of Virginia, School of Dentistry	915		
Meharry Dental College	1044		

University of Pittsburgh, School of Dentistry	912	Vanderbilt University, School of Dentistry	695
University of Southern California, College of Dentistry	1043	Washington University, School of Dentistry	916
University of Tennessee, College of Dentistry	803	Western Dental College	696
University of West Tennessee, Dental Department	695	Western Reserve University, School of Dentistry	797

DENTAL SOCIETY NOTES AND ANNOUNCEMENTS.

Academy of Stomatology of Philadelphia	1277	Kentucky State Dental Association	272
Alabama Board of Examiners	520	Maine Board of Examiners	523, 1057
Alpha Omega Dental Fraternity	1276	Maryland Board of Examiners	446, 1167
American Academy of Periodontology ..	816	Marquette University, Dental Alumni Association	1056
American Institute of Dental Teachers 95, 359, ...	1276	Massachusetts Board of Examiners 192, 520, ...	928
American Medical Association, Section on Stomatology	518	Michigan Board of Examiners, ...	521
American Society of Exodontists	925	Michigan State Dental Society	272
American Society of Orthodontists	191, 1276	Minnesota State Dental Association ..	95
Arizona Board of Examiners	523	Mississippi Board of Examiners	360
Arkansas Board of Examiners	447	Mississippi Dental Association	357
Association of Military Dental Surgeons 517, ...	926	Missouri Board of Examiners	446, 1057
Bronx County (N. Y.) Dental Society ..	1166	Missouri State Dental Association	95
California Board of Examiners	445, 1167	Montana Board of Examiners	96, 1278
California State Dental Association ...	358	National Association of Dental Faculties	926
Conference of Public School Dentists ..	816	National Association of Dental Librarians	1055
Connecticut Dental Commission ...	445, 1057	National Dental Association 271, 441, 515, 704, 812, ...	922, 1050
Connecticut Dental Hygienists' Association	358	National Mouth Hygiene Association ..	703
Connecticut State Dental Association ..	272	Nebraska Board of Examiners	520, 1166
Delaware Board of Examiners ..	96, 523, 1277	Nevada Board of Examiners	96
Delta Sigma Delta Fraternity	816	New England Dental Society	708
Dental Alumni Society of the University of Pennsylvania	443	New Jersey Board of Registration 192, 446, ...	927
Dental Hygiene Council of Massachusetts	817	New Jersey State Dental Society	444
Dental Protective Association of the United States	1166	New Jersey Board of Registration 192, 523, ...	1168
Dental Society of the State of New York	192, 517	New Jersey State Dental Society	519
Dental Surgeons of the American Expeditionary Forces	517	New York State Examinations in Dentistry	448
Dewey School of Orthodontia, Alumni Society	95	North Carolina Board of Examiners 95, 520, ...	1168
District of Columbia Board of Examiners	520	North Carolina Dental Society	359
District of Columbia Dental Society ..	271	North Dakota Board of Examiners ..	96, 709
Eastern Association of Graduates of the Angle School of Orthodontia	441	Northern Illinois Dental Society	709
Forsyth Dental Hygienists' Alumni Association	192, 445	Northern Indiana Dental Society	811
Forsyth Dental Infirmary for Children George Washington University, Department of Dentistry	444	Northern Ohio Dental Association	272
Idaho Board of Examiners	96	Northwestern University Dental School	359
Illinois Board of Registration	446, 1166	Ohio State Dental Society	1166
Illinois State Dental Society	95, 192	Ontario Dental Society	357
International Society of Prosthodontists ..	926	Pennsylvania Board of Examiners ..	447, 1167
Iowa Board of Examiners	192, 445, 928	Pennsylvania State Dental Society ...	358
Iowa State Dental Society	272	Philadelphia Dental College, Alumni Society	95, 358
Kansas Board of Examiners	445	Psi Omega Fraternity	271, 517
		Rhode Island Board of Registration 273, 448, 709, ...	1167
		Society of Dental Science, N. S. W. ..	520
		South Carolina Board of Examiners ..	273
		South Carolina Dental Association	517
		South Dakota Board of Examiners ..	360, 1168
		South Dakota State Dental Society	358

Southern California Dental Association	708	Utah Board of Examiners	523
Susquehanna Dental Association of		Vermont Board of Examiners	273
Pennsylvania	444	Vermont State Dental Society	191, 519
Tennessee Board of Examiners	522	Virginia Board of Examiners	359
Tennessee State Dental Association	519	Virginia State Dental Association	811
Texas Board of Examiners	1057	Washington State Board of Examiners	445
Texas State Dental Society	191, 358	Wyoming Board of Examiners	522

ARMY AND NAVY DENTAL NEWS.

NEWS NOTES	93, 187, 263, 352, 433, 510, 698, 808, 918, 1047, 1163, 1270
PREPAREDNESS LEAGUE OF AMERICAN DENTISTS	94, 189, 267, 435, 700, 920, 1272

Special Notices.

[See pages 190, 355, 437, 810, 1164, 1274.]

Monthly Record of Patents Relating to Dentistry.

PATENTS	96, 274, 360, 448, 524, 710, 818, 928, 1058, 1168, 1278
---------	---

INDEX.

INDEX TO VOLUME LXI	1279
---------------------	------



DR. THOMAS G. ALLER, JR.

THE DENTAL COSMOS

VOL. LXI.

JANUARY 1919.

No. 1

ORIGINAL COMMUNICATIONS

The Foundation Principles in the Mechanism of Speech, and the Importance of Training the Speech of Cleft-Palate Patients After Operations.

By CALVIN S. CASE, M.D., D.D.S., Chicago, Ill.

Part I.

THOSE who contemplate an operation for the correction of cleft palate, whether by prosthetic or surgical methods, should fully realize at the outset that the real object is not only to close the cleft through the soft and hard palate, but to furnish means to the patient by which he can learn to speak with distinct articulation and normal voice tone-quality.

One cannot appreciate the many requirements that are demanded of an artificially or a surgically restored palate until he fully understands the normal mechanism of speech and the main principles of phonology, and particularly the part which is played by the velum palati, whose function is destroyed by the cleft. This knowledge is quite as important in our college teaching, in pointing the way to the successful treatment of cleft pal-

ate, as it is to teach that occluso-proximate fillings in dentistry are for something more than closing the cavity in the tooth, and why the really successful operation demands the restoration of anatomical form and contact contours which nature has found imperative for the preservation of masticating occlusion and the future healthfulness of interproximal tissue. If these imperative foundation principles were not taught in the operative departments of our dental colleges, what hope would there be for the future success of our graduates in practice?

Not until one fully understands the functions of the velum palati in the activities of speech will he understand why it is that an operation for the correction of a cleft palate must furnish physical means by which the muscles and mental

activities may be trained to perform the involuntary acts and conceptions which occur normally in the production of distinct articulate sounds with the resonating tone-quality of perfect speech.

Proper intelligent instruction in the art of speaking correctly is quite as important to cleft-palate patients as the operation itself. Dr. G. Hudson-Makuen,* whose extensive experience in the teaching of cleft-palate pupils to speak renders his opinion of the greatest value, in speaking of the comparative value of training pupils to speak before and after *surgical* operations, says:

In the adolescent or adult cleft-palate patient, training will do more for the improvement of speech than will the operation. In other words, a patient who can have the advantage of but one of the two procedures can probably be given better speech by training alone than by the operation alone. The reason for this is apparent when we consider the limitations of the operation. In the first place, the speech, as I have shown, is defective in three important particulars, namely, in resonance, in melody, and in articulation. The extent to which we can improve the resonance and melody of the voice by the mere closure of the cleft—with a surgical operation—is very slight, because, however well the operation may be done, the patient will have but limited control of a more or less tense velum, and he will be unable, therefore, to regulate the size of the opening between the oropharynx and the naso-pharynx. It is upon the regulation of the size of this opening, which is constantly changing during speech production, that a normal resonance largely depends. When the opening is large, as in the cleft-palate case, the nasal resonance predominates, and when it is small the nasal resonance is diminished. Moreover, the rapid changes in pitch which result in the so-called melody of the voice cannot be made with any degree of accuracy, because the functions of the palatal and pharyngeal muscles, which have their lower attachments in the superior cornua of the thyroid cartilage of the larynx, are at least partially destroyed by the cicatricial contractions which follow the operation, and by the atrophy which has taken place from the disuse of these muscles before the operation was performed.

In view of the voluminous amount of evidence which proves that the surgical operation when performed after infancy rarely attains to the required standard of perfection—to say nothing of the thousands of utter failures even to unite the borders of the cleft—and in view also of the many evidences which have been exhibited at clinics of important societies and elsewhere, with extensively published literature pertaining thereto, and which prove that the modern velum obturator when properly constructed and followed with proper training, *does fully come up to this standard in every case*, it would seem that the common instincts of humanity would lead all honest surgeons to hesitate before taking the chance of wrecking the lives of so many patients by an operation which at best is purely experimental.

IMPORTANCE OF PROPER INSTRUCTION.

This leads to another important reason why those who perform these operations should understand the imperative demands of perfect speech, and be able to give to their patients after operation the proper foundation instruction, and then to supply them with written and illustrated exercises for future practice. If patients are left to parents or friends for occasional correction, with no intelligent or guiding rules for instruction and continual admonition along the line of correct practice, they may never learn to speak with perfect enunciation and tone, even when they are supplied with the most perfect surgical or artificial palate, because of the difficulty in overcoming long-continued habits of false muscular movements which may have been acquired through years of frantic efforts to be understood. Moreover, parents and members of the family cannot as a rule be relied upon to give adequate instruction, because they have learned to understand everything the cleft-palate child says, however imperfectly articulated, and therefore will not stop him as they should, at the very first oral element of speech which he fails to utter perfectly. Even the best of elocution teachers rarely

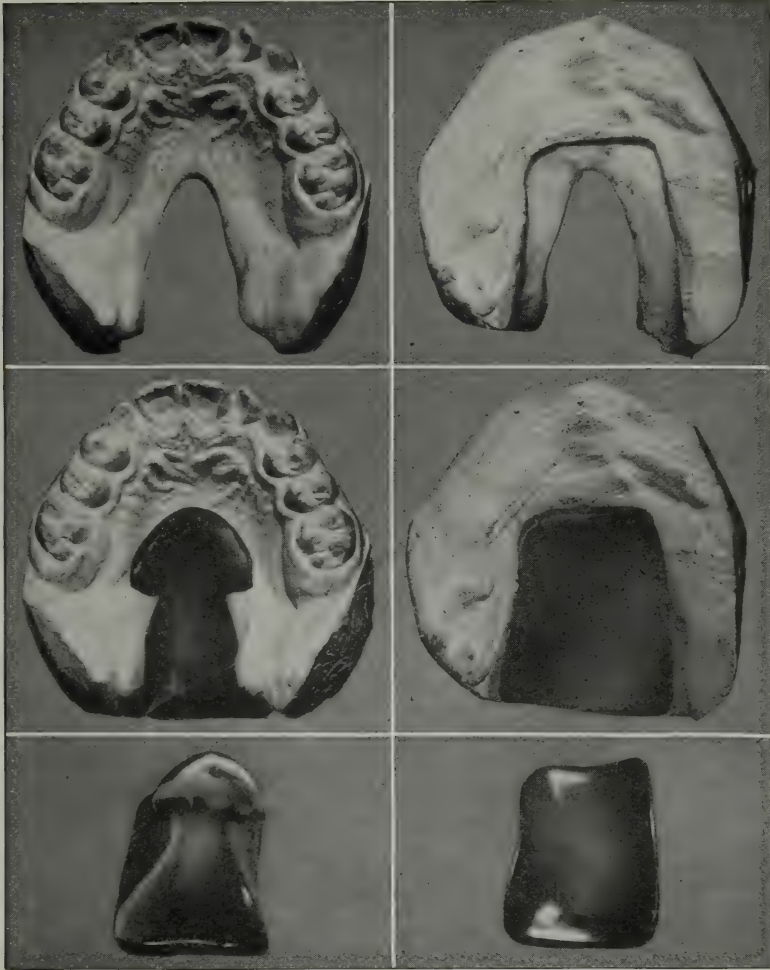
* "Oral Surgery," Dr. T. W. Brophy, chap. xxx.

employ the methods which are of the greatest importance in the teaching of cleft-palate pupils.

The surgical or prosthetic operation should be regarded as the preliminary

character and effectiveness of the operation, and second, upon the ability and persevering determination of the pupil. If the restoration is one which does not promise to give him full control of the

THE VELUM OBTURATOR.



On the left is an oral view, 1st, of a typical cleft; 2d, the velum obturator in position; 3d, the velum obturator. On the right are the nasal aspects.

work in giving to the patient the proper foundation to become a competent pupil for the acquirement of perfect speech. The success in the training branch of the operation will depend, first, upon the

speaking functions of the breath blasts, or on the other hand, if he does not appreciate the importance of perfect speech, the results are very liable to be unsatisfactory.

PRACTICAL TEACHING.

The teaching of cleft-palate patients to speak perfectly commences, in the author's practice, usually at the first or second sitting, because it takes about two weeks, in connection with other duties of practice, to make and fit the velum obturator. This time may be very advantageously employed by the patient in practicing on positions and articulate sounds, which will often be of great help later when he is supplied with means for fully directing and controlling the breath blasts. Moreover, as cleft-palate patients are often from distant localities, and though required to remain at least one week after the completion of the obturator, the time is barely sufficient to start them properly in the course of training, which really should be continued afterward under efficient tutelage.

At the first sitting the case is diagnosed with a view to determine the character of the cleft, and particularly its nasal sustaining relations, to decide the method that should be employed in taking the impression. At this sitting or the next, a thorough diagnosis of the speaking qualifications is made by having the patient pronounce as distinctly as possible short words containing collectively all the consonant oral elements of speech according to the illustrated chart.* Reference notes of the pupil's failures, with directions for correction, should be marked under each of the oral elements on the chart, to be later given to the pupil for reference in the absence of the teacher; or the chart may be supplemented with small pencil drawings showing the relative positions of the oral organs of speech illustrated by the chart and verified by the teacher. The vowel oral elements will be found to be quite perfectly articulated by all cleft-palate patients, though lacking in proper resonance and tone quality; this will come through special training after the mus-

cles have learned to completely close the naso-pharyngeal passage with the aid of the obturator.

In this first lesson the teacher will be able to determine which of the consonant oral elements are imperfectly made, and those which will require the most practice. At this time, or at the next lesson, he should be shown how to enunciate one or two of these sounds which require the least amount of air-pressure, with instruction to practice on the elementary sounds alone until quite perfect before joining them to the vowels or short syllables. This may require patiently repeated showings with every aid that will enable the pupil to properly place the tongue, etc., whose control and direction may be as awkward and difficult as a child learning to walk, as he has never before had these same muscles directed by the nerves into the speaking movements or positions. The most arduous but necessary part of the teacher's work is the repetition, over and over again, of the required sound, not only to show the requisite position and action of the oral organs, but to instil into the pupil a true conception of the sound-image.

SOUND-IMAGES.

The "sound-image" of an oral element of speech is the individual cognition of the exact sound of that element, so that one is able to detect the slightest imperfection in or variation from it when it is made by others or themselves, in the same way that a correct singer is able to detect the slightest flat or sharp of a musical note. All cleft-palate patients who have been obliged to speak perhaps for years in their imperfect way, have acquired false sound-images of all the utterances which have been impossible for them to articulate perfectly—with the result that they are absolutely unconscious of their own imperfections and wonder why they are not understood, often becoming quite indignant when people who are not accustomed to hearing them speak do not understand them. This is true also of some singers who will persist in flattening or sharpening cer-

* [This chart with explanation will be published with the second instalment of this article, which will appear in our next issue. —ED.]

tain notes because they have acquired false sound-images of those notes.

Albert Salisbury in his work on "Phonology and Orthoepy" makes the following statement:

Correct enunciation and resonance depend primarily on the correct position of the several organs of speech. It is therefore of vital importance that the teacher should in the first place, know what the *correct sounds* are to the ear, and in the second place, what the correct positions of the oral organs are for producing the exact sound required. When the teacher finds in the pupil a wrong habit of sound production, the first point of attack should be the securing of a correct sound-image; the next should be the securing of the proper position of the organs for producing that sound.

With cleft-palate pupils it is usually necessary to reverse this order, and teach them, first, the position, to enable them to make the proper sounds by which they acquire the sound-image. When a word or syllable is found to be imperfectly articulated, it should at once be divided into its oral elements and the pupil required to practice upon the isolated elementary sounds in which he fails, until he becomes proficient in that part, before he attempts to pronounce the whole word.

It can be seen by this that the psychological development of the mental concepts of correct articulate sounds of the oral elements of spoken words is quite as important as the restorative operation and the physical development of the inhibited activities of the muscles. Nor will true development in either case arise until the cleft-palate patient is first supplied with adequate physical means that will ultimately enable an exact duplication of the indispensable functions of the velum palati.

When the obturator is finished, the patient then becomes the pupil in phonology and orthoepy, and the real instruction commences toward giving him the proper foundation for speaking—not only in perfect articulation, but in normal voice tone and resonance, with the proper pronunciation of the most difficult words.

It is the custom of the author to give the lessons to the pupil in a closed room free from the embarrassment of listeners, and to pursue the teaching for fifteen or twenty minutes, and then leave him alone for an hour's practice. As a supplement and variation from the breath sounds of the consonant oral elements, the pupil should practice on the vocal elements—especially that of **ah**, made with a strong, forcible, guttural expression, not once or twice, but at least fifty times, one after the other. This may then be joined to the acquired sounds of the explosives, as **bă**, **tă**, etc., and continued with the same forcible utterance. The object of this exercise is to strengthen and develop the pharyngeal and palatal muscles so that they will firmly and involuntarily close around the artificial veil of the palate and completely prevent the vocalized air from escaping into the nose. Tongue gymnastics are of the greatest importance in reviving the normal activities of the tongue by voluntary movements in direction, position, and rapidity. Along this line the rapid utterance of each of the explosive oral elements, **tă**, **dă**, **lă**, etc. (la-la-la, la-la-la), will be found very difficult for most cleft-palate pupils to utter rapidly at the start.

The pupil may quietly practice all the voiceless breath sounds of the consonants when he is not otherwise engaged. Even the sibilants **c** and **s** may be practiced quietly at almost all times, at home or on the street, when there are no interferences.

The patient should be kept in training under immediate supervision and instruction until there is every reason to believe he will follow up the instruction, aided by the drawings, or that he will be placed in the hands of competent teachers.

With patients too young to understand and appreciate the requirements and necessity of continued practice until they have fully acquired the correct utterances and "sound-images" of the oral elements they fail to articulate, the instruction sheets should be given to the parents for their instruction as teachers,

or for the information of teachers who are employed for this purpose.

If a surgical operation has been performed during infancy, or before the child has commenced to talk (and this in the opinion of the author is the only time when a surgical operation for cleft palate should be performed), the rule in regard to the instruction sheets should be considered quite as imperative, and should include all the consonant oral elements of speech which cleft-palate patients in general fail to articulate distinctly. Instruction should then begin at the very first word the child attempts to articulate. In that way he will very soon acquire the sound-image, and his efforts to reach it *will act as a mechanical stimulation* toward natural-growth development of the velum and co-operating muscles. It is the lack of velum tissue growth in proportion with the growth and development of surrounding parts, due to the disuse of the speaking muscles, which causes most of the failures that result from surgical operations in infancy. If the cleft is closed skillfully at that time, and the velum is sufficiently adequate to close the nasopharyngeal passage when the child commences to speak, and if from that time on there is intelligent *insistence* that he shall speak distinctly, the results without doubt will be all that can be desired.

IMPORTANCE OF SYSTEMATIC INSTRUCTION IN THE MANAGEMENT OF THE LIPS, TONGUE, VOICE, ETC.

The operator or teacher will frequently be surprised to find how much improvement can be made by proper instruction in the speech of nearly all patients, even before they are supplied with any other aid. This is easily accounted for by the fact that they rarely have received from their parents or school teachers the slightest systematic instruction in regard to the management of the lips, tongue, or voice, because it is an exceedingly sensitive subject at home and abroad, evoking only pity for this terrible deformity, of which the immediate friends are inclined to believe that nothing except an oper-

ation will enable them to speak normally. Besides this, the fact that the family soon learn to fully understand everything the patient says, causes him to believe that he speaks quite perfectly. For instance, nearly all cleft-palate patients before receiving aid will make fairly close imitations with the throat muscles of the sibilant and many other aspirate and explosive sounds to whose defects they are wholly blind, though quite noticeable and to strangers not always intelligible. As the sibilant is such an important element of correct articulation when made properly at the tip end of the tongue with a high thin whistle, and as it requires but a slight pressure of air, it is usually their first lesson. Occasionally they succeed in distinctly sounding **s** in **yes**, even before the artificial palate is inserted, though never having made it distinctly before.

Again, one will meet patients with large open clefts who will distinctly pronounce words containing certain oral elements which the majority of patients cannot intelligibly approach before operation. And perhaps this same patient may have the greatest difficulty in acquiring the perfect enunciation of other articulate sounds that are usually quite easy to acquire. One patient twenty-five years of age, rapidly learned to speak with remarkable distinctness in articulation and tone, except in joining the elements of **t** and **o** in **toe**, which required months of persevering practice to acquire. Another patient, about sixteen years of age, who otherwise spoke perfectly, was unable for months to unite the sound of **b** with **gā**, in the word **began**.

One of the patients who was exhibited by the author at the recent clinic of the National Dental Association in Chicago, distinctly articulated—and mostly with strong oral resonance—even the most tongue-twisting words that were given to her by the members, except the plural of words ending in **g**. In pronouncing **dogs**, she gave the clear sibilant as in **cats**, instead of the vocalized sibilant **z**. As this patient had been wearing the obturator only a short time, there is

every reason to believe she will soon speak without the slightest imperfection.

Another patient eleven years of age was also presented, for whom the construction of the obturator had just been started. The impression and the method of taking it was described; also there was shown in the mouth the modeling-compound trial model of the obturator, which, though much heavier than the final hard-rubber one, perfectly retained its position without being sustained artificially. This exhibition was quite an advantage, because it enabled the writer to show clearly the action of the pharyngeal muscles in relation to the veil of the obturator in the act of closing the passage to the nose. This little patient had been operated upon seven times surgically for the closure of the cleft, with the result that all the soft palatal tissue and a portion of the pharyngeal tissue were destroyed. The object in mentioning this case here is to say that before insertion of the obturator, notwithstanding the loss of so much throat tissue, after a very little preliminary training she could distinctly enunciate—though not sharply or without the nasal tone—a large number of the explosive and aspirate oral elements of speech, and seemingly with a normal action of the tongue and lips—and this in itself is very unusual before receiving thorough instruction.

To continue the history of this interesting case: One week after the finished obturator was placed in the mouth, many of the most prominent surgeons and dentists of Chicago came to my office by invitation, to see the obturator in action, and they were surprised, as I was, with her very rapid acquirement of what will very soon culminate in perfect speech.

One of the most important peculiarities of the present velum obturator, and the one which places it on a scientific basis in its relation to all the requirements of articulation and resonance, is the feature that—in its typical state—it does not require any attachment to a plate or other dental device to hold it in position, it being sustained through its perfectly fitted nasal and palatal extensions, and mostly because of the peculiar

form and position of the veil and its relation to the walls of the pharynx and the action of the pharyngeal and palatal muscles.

The importance of doing without a supporting plate for the obturator, therefore, is not merely one of convenience to the patient, but it is the one principle which permits all the requirements of normal speech.

The most potent factors of the remarkable success of this form of obturator in the restoration of speech are its extremely light weight and its free mobility and quick response to the slightest movement of the muscles; and when it is surrounded within their grasp in its act of completely closing the passage to the nose, it takes the same favorable position in relation to the vibratory voice blasts as the normal velum palati, whose function and activities it seems to closely imitate. It was this which led the late Dr. John B. Murphy to say: "Its motion really seems uncanny, it is so natural." This will be more fully appreciated when we come to study all the requirements in the mechanism of speech.

In works upon general phonology and orthoepy it has not been regarded as especially important to understand the anatomy and physiology of the palatal and pharyngeal muscles, or the exact details, with illustrations, of the relative positions and action of the tongue and other oral organs of speech; nor is there any particular stress laid upon the importance of a complete closure of the naso-pharyngeal passage, because general instruction in the art of speaking perfectly pertains to that class of pupil whose muscles and controlling nerves are sufficiently unimpaired to require no more than the developing stimulation of right teaching and practice toward the psychological acquirement and attainment of the exact sounds of the oral elements not properly articulated by the pupil.

In the training toward this object, the specialized organs of speech intuitively take the right positions without being told, so to speak, whereas the requirements of teaching are quite different

with cleft-palate pupils, who up to the time of the operation have been debarred the power to control the force and direction of the speaking breath blasts for the utterance of nearly all the consonant oral elements, and who therefore have been driven, in their efforts to be understood, to a wrong and inadequate employment of those muscles which were not intended for speech, and a complete disuse of the muscles which should control the main organs of normal speech—with the result that the function and action of the principal speaking muscles and guiding nerves are wholly untrained, and in addition to this the palatal and pharyngeal muscles are more or less atrophied. Consequently, the functional position and action of the voluntary oral organs of speech must be carefully and specifically taught them before they can be expected to make the proper utterances.

Moreover, the muscles have acquired false habits of action in their efforts to produce intelligible speech, and this is often quite difficult to overcome, mainly because the pupil has acquired a false conception of the articulate sounds he utters. But when the proper sound-image is stamped indelibly upon his mind, it will then be surely followed by the involuntary movement of the right muscles for its production. Just as the pupil at the piano must at first be taught how and where to place the fingers on the keys to get the required sounds, while later this is followed with hardly a thought of the fingers, which are now almost wholly directed by the efferent motor impulses from ganglia under the subconscious control of the brain, which is now thinking only of the musical staff or the tone images which it indicates.

The training, therefore, should be that which will most successfully utilize the impaired palatal and pharyngeal muscles with the view of stimulating their development toward a revivification of their inherited activities, for no really successful prosthetic or surgical operation can be accomplished without their functional co-operation. Furthermore, in order that the patient receive the full benefit

of the operation, a character of teaching and training that is especially adapted to this class of pupils is of the utmost importance. The responsibility of this must lie with the operator, or a teacher who has full knowledge of the special needs and methods which should be employed. This can come only, as stated before, with a perfect understanding of the phonological mechanism of normal speech and those principles of teaching which should be employed with pupils who have been wholly deprived of the use of the principal organs of speech.

PRINCIPLES OF PHONOLOGY.

Foreword. It will be impossible in the short space of an article to give more than a glance at the general principles of phonology, omitting much that should be regarded as of great importance, as found in works upon general phonology and orthoepy, to which the student is earnestly referred.

Those principles, however, which pertain especially to this particular work are given here in the fullest detail, with additions from the author derived from the teaching of cleft-palate pupils and designed especially to emphasize the importance of methods whose employment, though not so material in the general teaching of phonology, is of the greatest importance to us. Therefore, much stress has been laid upon the function of the velum palati and to the peculiar defects in the mechanism which arise from its loss. In order to arrive at the most successful correction of those special imperfections, the author has found it necessary to divide or classify the consonant oral elements upon a basis which it is hoped will more sharply illustrate slight but important differences in enunciation which might otherwise be easily overlooked.

As all of the VOWEL ELEMENTS are distinctly enunciated by persons with open cleft palates—*though with imperfect tone*—the need of teaching the required position of the tongue, etc., in these utterances, may be considered, in this work for the instruction of cleft-

palate patients, of lesser importance. Consequently, there has been given to the vowel branch no more than a cursory explanation, with no illustrations; the principal teaching being devoted to the more exhaustive and systematic explanations and illustrations of the consonant utterances which cleft-palate pupils have been unable to enunciate properly.

It would be well to state, however, in this connection, that the vowel, or vocal, utterances are the most important elements of speech, as they are the only pure elements which are composed of the vibratory voice blasts; consequently they are the only parts of speech which present the vocally vibratory audible sounds, except when certain consonant utterances are intoned at the vocal cords, as in pronouncing *z*, whereas the true voiceless consonant sounds are made by a forcible expelling of the unvocalized air through constricted openings and regulated passages in their function of giving the beginning and finishing touches to the vocals. Notwithstanding the fact that nearly all vowel utterances with open cleft palates are distinctly articulated, they are completely lacking in the important elements of tone and resonance, because the vocalized air passes freely into the nasal chambers, imparting to the sound the nasal quality. One can see by this how a complete closure of every passage to the nasal chambers is necessary for the perfect utterance of the vowels as well as of the consonant oral elements.

THE MECHANISM OF SPEECH.

The framework of the speaking machine is the thorax, the trachea, the pharynx, the oral and nasal cavities, the jaws, the dentures, and the roof of the mouth. The active or mobile parts of this machine are the diaphragm, intercostal muscles, vocal cords, pharyngeal, palatal, lingual, labial, and buccinator muscles. To these may be added the hyoid and masseter muscles, which aid in regulating the different required sizes of the oral cavity by opening and closing the jaws. The action of this co-ordinated

machinery, which is fed with expirations of air from the lungs, and whose product is spoken language, is worthy of the deepest study by dentists and oral surgeons, whose every department of applied science is concerned in perfecting or in marring its mechanism.

The sensations which we cognize as sounds, of every character, reach the brain through the auditory apparatus, which is thrown into functional activity usually by vibratory wave movements of air striking the drum or diaphragm of the ear. A somewhat prolonged and forcible expiration of breath from the lungs throws into vibrations the vocal cords of the larynx, which in turn impart their vibrations to the air, and give rise to the sound we call voice. Its quality, pitch, and loudness are regulated by the character of the tissues which compose the cords, their tension, and the force of the air blasts.

As this column of speaking breath travels on upward and through the mouth it comes under the influence of certain definite muscular movements and restrictions, which stop or interrupt its free passage or force it into certain chambers or channels of different forms by which it is molded into speech or vocal language. Therefore, to speak distinctly, there are certain physical requirements which must be fulfilled. Among the foremost of these is the necessity of completely closing the nasopharyngeal passage so that in all parts of speech, except the sounds of *m*, *n*, and *ng*, not a particle of the expired breath used in talking can escape into the nose; otherwise, as will be shown, it is impossible to enunciate properly and distinctly all vowel and nearly all consonant utterances.

In the involuntary intermitting function of closing and opening the passage to the nose, the velum palati acts with almost lightning-like rapidity in the perfect enunciation of rapidly spoken words, and especially those words in which certain oral elements which demand that this passage be open, are joined to, or lie between, other oral elements which demand that it be closed.

For instance, in the word **and**, the beginning vowel **a** requires this passage closed for resonating quality, the **n** requires with equal importance that it be open for its peculiar nasal tone quality, and the **d** that it be again fully closed for its distinct explosive articulation.

One can understand by this example alone something of the difficulties which confront the surgical operator in an endeavor to not only close extensive clefts of the hard and soft palate for patients older than five years, but to construct a plastic velum, necessarily composed largely of cicatricial tissue, which will act with that light sensitive mobility which is demanded of the normal palate in its activities of perfect speech; and also how impossible it would be to accomplish these indispensable requisites of speech with any form of artificial palate or obturator that is attached to a dental fixture, or one that will not quickly and rapidly move, as does the normal velum, with the very lightest touch of the muscles which control it.

The complete closure of this passage, principally by the velum palati, enables the performance of two indispensable functions of speech. First, it enables the forcing of the unvoiced air into and through the speaking-tube of the mouth with that forcible pressure which is necessary for the distinct and perfect enunciation of the consonant explosive and aspirate oral elements, and which would not be possible with this passage open, any more than it would be possible for a syringe or a chip-blower to functionate with a hole through its side. Second, in this act of closure, it enables the production of natural voice tone-quality and melody of resonance, in both speaking and singing, which also would not be possible with this passage open. It would seem that the vibratory voice blasts of the vocals when confined to the oro-pharyngeal speaking-tube are thrown into more intensified vibrations,

whose wave impacts are thus more effectually communicated and transmitted through the medium of the velum palati and surrounding tissues to the resonating chambers of the head.

The student will appreciate this if he will forcibly utter the vowel oral element, **ah**, and note the strong natural oral tone and resonating voice quality, which, in the less rapid vibrations of low tone registers, produces a perceptible quivering of the throat tissues, easily felt by the fingers on the outside of the throat. Now make the same effort with the palate dropped so that the vibrating air can pass freely into the nose, and note the nasal tone and lack of forceful resonating voice quality. In this process the thin sensitive velum palati, stretched backward in drum-like tenseness toward the walls of the pharynx to co-operate with the pharyngeal muscles in closing the passage to the upper pharynx and nose, is an admirable transmitter of the voice waves to the real sounding-board of the head. An important feature in this act is the position of the velum lying almost at right angles to the voice blasts directly from the glottis. It is this position of the veil of the obturator, also, that enables it to so closely imitate the action and function of the normal velum.

It will be observed that the attainment of natural voice quality, with its resonance and melody in both speaking and singing, is not accomplished by allowing the original vibratory air of the voice to enter the nasal chambers, otherwise there would result an unpleasant nasal tone, devoid of true resonating richness. The vocalized air is therefore completely and wholly stopped at the velum palati, which enables it to be thrown into more intense imparting and transmitting activity, in this wonderful voice instrument, before the sound waves are properly molded and sent forth to the outer air as natural speaking and singing voice tones.

(To be continued.)

The Application of Engineering Principles for the Predetermination of Arch Outlines.

By ALEXANDER SVED, B.S. in C.E., D.D.S., New York, N. Y.

IN the past few years very much has been said and written about the application of engineering principles to orthodontia. The two important problems which were considered from an engineering standpoint were appliance design and arch predetermination. In the design of appliances many perplexing problems were solved by the proper application of analytical mechanics, and now it is accepted by the majority of orthodontists that the use of such methods will lead to the most efficient working appliances. This phase of the subject, however, did not receive very much discussion, for it was readily realized that the bringing about of tooth movement is a mechanical problem, and as such it should be solved by the proper application of engineering principles.

The different methods offered for the predetermination of the dental arches met with a great deal of opposition. The arch outline in most instances did not correspond with the form which is considered by the majority as the ideal, and the complicated nature of the methods, in some cases, did not allow of their general adoption.

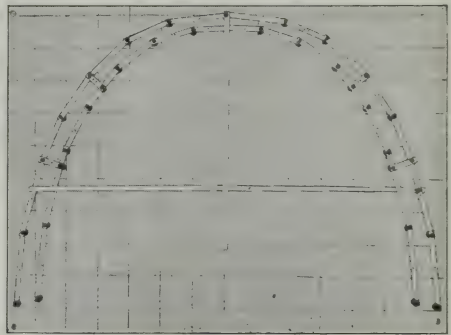
ANALYSIS OF DR. STANTON'S METHOD OF PREDETERMINING THE ARCH OUTLINES.

The earliest attempts at predetermining the dental arches have been superseded by a method devised by Dr. F. L. Stanton of New York, who claims to be able to predetermine with mathematical accuracy by his method the correct arch outlines and the position that each tooth should occupy in the proper arch.

Dr. Stanton must be complimented on

his efforts to obtain a solution of this problem, and we must acknowledge that his principles are correct to a large extent. Yet, when the application of those principles is studied it will be found that the final result is just as far from being correct as was that obtained by the so-often-discussed Hawley's charts. We must not be misled by the fact that Dr.

FIG. 1.



The occlusograph.

Stanton gives the measurements of the proposed arch to the nearest thousandth of a millimeter, for such preciseness signifies only an exact mathematical expression of an incorrect arch outline, which was constructed by the methods of engineering from carelessly assumed conditions. If I correctly understand Dr. Stanton, he measures the greatest mesiodistal diameter of all teeth from perfect plaster models, and then he turns to a mechanical device, called the "occlusograph" (Fig. 1), by which the arch outline is predetermined.

This instrument consists of a series

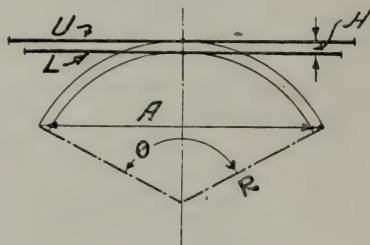
of links corresponding to the number of teeth present in a perfect arch. These links are made in different lengths to correspond with the mesio-distal diameter of the teeth they represent, and can be placed in series when a given arch is to be analyzed. Thus two series of links are arranged in the order of the teeth, one for the upper and one for the lower arch. Each series represents its respective arch, enlarged several times and spread out in a straight line. These series are then fixed to each other in such a relation that the teeth will be in perfect occlusion. To accomplish this, the distance from the buccal cusps to the center of the fossa on the occlusal surfaces of the teeth is measured in the molar and bicuspid regions and the overbite selected. If I am correctly informed, the horizontal overbite, according to Dr. Stanton, is numerically equal to the product of the sum of the greatest mesio-distal diameters of the six upper anterior teeth and some constant, which is about .045. Keeping these measurements in mind, the upper and lower series of links are clamped in position as shown by the illustration (Fig. 1). The two cross-bars are used to obtain symmetry of the arches.

The basic principle involved in this method is the bending of the upper and lower alignment lines until perfect occlusal relationship is established between them. This principle is correct, but cannot be applied to every portion of the dental arches in the same plane.

In Dr. Stanton's method, the most important factor which influences the arch outline is the horizontal overbite. The primary effect of the overbite is on the radius of the anterior curve, which in turn has a great influence on the width of the arch in the cuspid and molar regions. To show how far-reaching is the effect of a very small variation from the true value of the overbite on the width of the arch, let us assume that the line U on the illustration (Fig. 2) represents the sum of the mesio-distal diameters of the six upper anterior teeth, and the line L that of the six lower anterior teeth plus twice the mesial half of the first lower bicuspids.

The letter H represents the horizontal overbite. In order to bring these two lines into proper occlusal relation, they must be bent into an arc of a circle which shall have such a curvature that the radii drawn through the extremities of one line touch the extremities of the other. This is a necessary condition, for it is a known fact that the buccal cusp of the lower first bicuspid falls between the upper canine and the first bicuspid.

FIG. 2.



When such a relation is established, the angle subtended at the center of the circle by each line is the same, and shall be called θ . A radian may be defined as that angle at the center of a circle which is subtended by an arc equal in length to the radius. Then

$$\frac{U}{R} = \theta \text{ radians}$$

and

$$\frac{L}{R-H} = \theta \text{ radians}$$

Therefore

$$\frac{U}{R} = \frac{L}{R-H}$$

solving for R

$$R = H \left(\frac{U}{U-L} \right)$$

By this formula, the radius R of the upper anterior curve can be calculated.

Substituting this value of R into the very first equation:

$$\frac{U}{R} = \theta = \frac{U}{H \left(\frac{U}{U-L} \right)}$$

$$\therefore \theta = \frac{U-L}{H} \text{ radians}$$

If the width of the upper arch, measured directly across the distal surfaces of the canines, is represented by A , then

$$A = 2R \sin \frac{\theta}{2}$$

$$\text{or } A = 2H \left(\frac{U}{U-L} \right) \sin \frac{\theta}{2}$$

Here we derived two expressions, one for the radius of the anterior curve and the other for the width of the arch immediately behind the cuspids.

If the last two columns in the table Fig. 3 are examined, it is readily seen that a change of one-tenth millimeter in the horizontal overbite gives a corresponding change of almost two millimeters in the radius of the anterior curve, and a variable amount in the width of the arch. This is significant, for if we recollect that in this method

FIG. 3.

TABLE SHOWING VALUES OF "A" & "R" FOR ASSUMED VALUES OF "H"

Assumed Values of "H" in mm.	θ		$\frac{\theta}{2}$ in Degrees	$\sin \frac{\theta}{2}$	"A" in mm.	R in mm.
	Radians	Degrees				
1.0	2.70	154° 41'	77° 20' 30"	.9757	33.3	17.04
1.1	2.45	140° 22'	70° 11' 00"	.9408	35.2	18.74
1.2	2.25	128° 54'	64° 27' 00"	.9022	37.0	20.44
1.3	2.08	119° 10'	59° 35' 00"	.8624	38.2	22.15
1.4	1.93	110° 34'	55° 17' 00"	.8220	39.2	23.85
1.5	1.80	103° 07'	51° 33' 30"	.7832	40.0	25.56
1.6	1.69	96° 49'	48° 24' 30"	.7478	40.8	27.26
1.7	1.59	91° 06'	45° 33' 00"	.7139	41.4	28.96
1.8	1.50	85° 56'	42° 58' 00"	.6816	42.0	30.67
1.9	1.42	81° 21'	40° 40' 30"	.6518	42.5	32.37
2.0	1.35	77° 20'	38° 40' 00"	.6248	42.5	34.07

By the use of these formulæ these values were calculated for different values of the horizontal overbite, which differ from each other by only one-tenth of a millimeter, which is indeed a very small difference. The dimensions of the teeth used in the calculations are shown below:

Tooth.	Upper.	Lower.
Central	9.0	5.4
Lateral	6.4	5.9
Cuspid	7.6	6.9
1st bicuspid	7.2	6.9
2d "	6.8	7.1
1st molar	10.7	11.2

the overbite is selected, and if in its selection an error of a few tenths of a millimeter is made, a considerable distortion of the arch will result. It must be admitted that such an error in the selection of the overbite is very likely to occur, and that the chance of correctly guessing the proper value is comparatively small. Then, on the other hand, we know that the overlap may vary from an edge-to-edge bite to 1 or 1.5 millimeters or more in some cases. Since, at present, there is no method by which the correct value can be determined, it seems impossible to correctly predeter-

mine the outline of the arch by a process in which a slight variation from the true

FIG. 4.

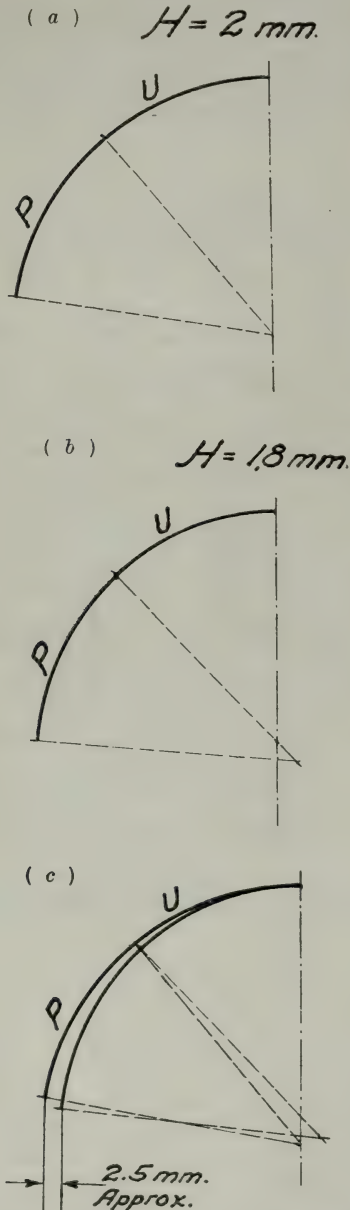


Diagram c shows a and b superimposed.

value of the overbite will result in the distortion of the shape of the arch. In

this method it is assumed that the value of the overbite is in direct proportion to the size of the anterior teeth. *If that is true, then an edge-to-edge or zero overbite is only possible when the sum of the mesio-distal diameters of the six upper anterior teeth is zero, or, in other words, when there are no anterior teeth.* This may seem to be a very far-fetched argument, but it is possible to have an edge-to-edge bite, and a method which fails within the possible range of its application must be considered absurd.

It has been mentioned that an incorrectly selected overbite affects the width of the arch in the molar region also. A diagram will show this with sufficient clearness, and for this reason a very elaborate mathematical demonstration is unnecessary. By the use of the occlusograph, Dr. Stanton follows the same method in the posterior part of the arches as in the anterior. That is, the upper and lower series of links of the occlusograph are bent into the arc of some curve until occlusion is established. Let us assume that after perfect occlusion has been obtained, the curve P (Fig. 4) represents the outline of the posterior part of the upper arch along the buccal cusps of the teeth. The nature of this curve is immaterial in this discussion. It does not matter whether we use part of a circle, parabola, or hyperbola, as long as we use the same part of the same curve in all our diagrams.

Let curve U represent the curve of the upper anterior teeth. If in diagram a (Fig. 4) curve P is assumed to have the same radius as curve U, it is clear that both will have the same center. The anterior curve in diagram a has the calculated radius when the selected overbite is 2 millimeters. It is clear that since the relative sum of the mesio-distal diameters of the upper and lower posterior teeth is kept constant during this demonstration, the curvature of the curve P must remain constant, irrespective of the radius of the anterior curve. Therefore, if we apply the same curve to a condition where the overbite is 1.8 millimeters, we obtain an arch outline as shown in diagram b. Diagram c shows

the two mentioned arch outlines superimposed.

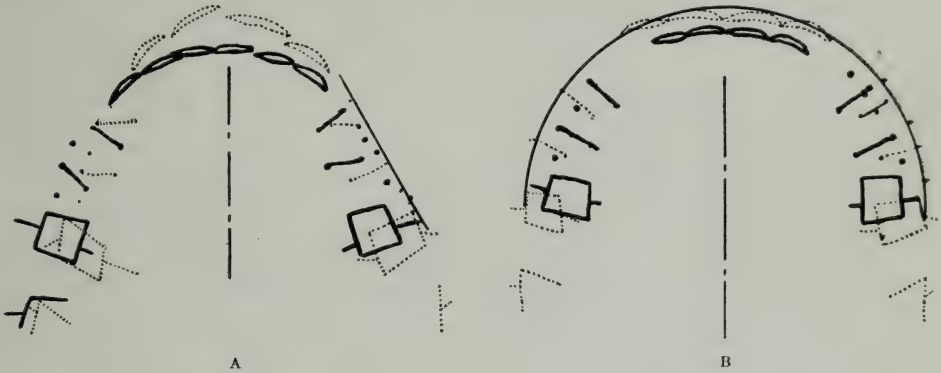
The distance between the extremities of the two P curves in diagram *c* measures about 2.5 millimeters. *This indicates that an error of two-tenths of a millimeter in the selection of the overbite will result in a corresponding error of 5 millimeters in the width of the arch at the molar region, or approximately $2\frac{1}{2}$ millimeters for every one-tenth millimeter variation from the true value of the horizontal overlap.*

The analysis given may appear to be directed too much against Dr. Stanton's

determination of the dental arches, in which all tendencies of Nature are disregarded? and are we going to change the natural shape of a patient's mouth just because an engineer happened to calculate the proposed incorrect position of the teeth to the nearest thousandth of a millimeter? I turn to the profession to definitely settle this problem, and I hope that everyone will be convinced of the correctness of my deductions.

If the problem of arch predetermination is to be correctly solved, we must approach it from a different angle. We must generalize the properties of the den-

FIG. 5.



A, Engineering survey. (Uppers light, lowers dark.) On left side, lower teeth outside of upper teeth. The bicuspid are also mesio-distally incorrect on the left side. Note on right side the good relation between upper and lower side teeth. B, Occlusion map determined by an engineer with an engineering instrument. (Uppers light, lowers dark.)

method, but the illustration in Fig. 5 will conclusively show that the occlusograph gives exactly the discussed conditions. This illustration was taken from one of Dr. Stanton's articles, a series of which appeared in the *Dental Digest*.

From Fig. 5, B, it appears that the occlusograph gave the outline of the arch as a perfect semicircle, as shown by the heavy line which I have drawn. On comparing this outline with the survey in Fig. 5, A, it may be noted that *the distinct tendency of Nature to arrange the posterior teeth in a straight line is disregarded by Dr. Stanton, and he proposes to arrange the teeth along a curve.*

Now the question arises, Are we going to accept a faulty theory, for the pre-

tal arches, and not a single peculiarity of nature should be neglected in drawing conclusions. To assume that a given set of teeth is susceptible to occlusion in only one form of arch, and to assume the arch outline to be circular, elliptical, parabolic, or hyperbolic in outline, and by a process of trial to determine which one of these curves would be more suitable to bring that set of teeth into occlusion, is a method which cannot be too strongly condemned. Such a procedure is not only laborious and expensive, but is also extremely impractical. Arches were analyzed in such a manner by Hanau, who did not lay much stress upon the general properties of human arches beyond occlusal relations. Early in his investigations he held that only

one form of arch would bring a given set of teeth into occlusion, but now he states that they can be made to occlude in a very large number of arch forms, and if that is the case it is a matter of mere chance whether a circular, elliptical, or any other form of arch is decided upon by his method of trial.

ANALYSIS OF THE AUTHOR'S METHOD OF PREDETERMINING THE ARCH OUTLINES.

To properly predetermine the dimensions and the outline of an arch, we must have a definite knowledge not only of the relative positions of the individual occluding teeth, but we must also know what position every tooth should occupy with respect to every other tooth in the arch.

In an article published in the *DENTAL COSMOS* for November 1917, I derived the relationship which exists between the dimensions of teeth and the dimensions of the arch. From the data, for which I am greatly indebted to Dr. Percy N. Williams of New York, I showed that in the upper arch there are five points which lie on the circumference of a circle, the center of which is midway between the two first molars on a line joining their buccal grooves. These five points are—the buccal grooves of the two first molars, the tips of the two canines, and the point between the central incisors on the median line. This relation is so rigid in a normally developed arch that the values which I calculated corresponded within 1 or 2 millimeters with Dr. Williams' measurements. Fifty-four arches were taken at random, and in about 30 per cent. the calculated and measured values differed by only a fraction of a millimeter. In about 40 per cent. the variation was 2 millimeters or less, and in the remaining 30 per cent. the difference, in the majority of cases, was not higher than 4 millimeters in the width of the arch.

These figures are very significant, for even these small differences are reduced when the errors in measurements are accounted for. I discussed this point in my article, and explained why they

appear to be magnified. If such a close correspondence is obtained between the calculated and measured widths of the arches in 70 per cent. of the cases, the remaining 30 per cent. can be considered abnormal, because we know that not all human arches are perfect, and the relation which was already stated to exist between the teeth can be considered to be present in all normal arches.

Since three points on the anterior curve were proved to be on the circumference of a circle, the anterior curve can be considered to be a circle. The posterior teeth, from the tips of the cuspids to the buccal grooves of the first molars, are arranged along a straight line. This is known to be the case from the examination of a large number of arches, and has been verified by Dr. Stanton's survey of the original case (Fig. 5, B).

These properties of the normal human dental arch were used by the writer in deriving the following formula, by the use of which the dimensions of the arch can be calculated from the measured mesio-distal diameters of the teeth:

$$2R = .92U + \sqrt{2M^2 + (.92U)^2}$$

—where

R = Radius of upper anterior curve.

U = Sum of mesio-distal diameters of upper central lateral, and mesial half of cuspid.

M = Sum of mesio-distal diameters of teeth included between the tip of canine and buccal groove of first molar.

This formula is only applicable to the upper arch. The form of the lower can be obtained directly from the upper by a simple graphic method or a more complicated algebraic process. After the radius of the upper arch has been calculated, a semicircle is drawn. (Fig. 6.) To determine the positions of the cuspids, arcs are made to intersect this semicircle, with the extremities of its diam-

* "Mathematics of the Normal Dental Arch," by Alexander Sved, *DENTAL COSMOS*, November 1917, p. 1116.

eter as centers, and the calculated distance between the buccal grooves of the first molars and the tips of the cuspids as radius. The line drawn through the extremities of the diameter of the semicircle, and the points thus located, will represent the line for the buccal cusps of the posterior teeth of the upper arch.

The use of a single formula for the predetermination of the upper arch was condemned by Dr. Stanton on the same grounds as Hawley's charts, namely, that a single form of arch will not account for variations occurring between racial and temperamental types. On this point I do not wish to be misunderstood. I

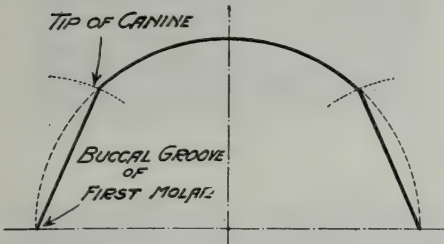
have a narrow appearance. This, however, does not limit the applicability of the formula, as all this is taken care of by the consideration of the anterior and posterior teeth as separate units.

I also admit that a certain degree of curvature may seem to be present in the bicuspid region, and this can be more clearly seen on photographic plates. Here I wish to emphasize that the buccal cusps and not the buccal surfaces of the posterior teeth are placed along a straight line. A line touching the buccal surfaces of the posterior teeth is a graceful curve, which may be pronounced, especially in the bicuspid region. This, again, does not limit the range of application of the formula, and the fact that in a normal arch the six anterior teeth lie along the circumference of a circle whose diameter is the distance between the buccal grooves of the first molars, and that the buccal cusps of the posterior teeth are on a straight line, will be true for all arches regardless of type. Nature follows a definite plan in the construction of animal mechanisms, and the dental arches which form part of the masticatory mechanism are also constructed according to a fixed plan.

All this is clearly shown by the illustrations in Fig. 7, which represent typical arch outlines for the four basal temperaments. It may be noted that the arches of the bilious and nervous temperaments are unsymmetrical, and that the left side is approximately normal in each case. The sanguine and lymphatic arches are very nearly normal. The diagrammatic outlines are drawn slightly larger than the proper size, for the sake of clearness. The writer selected these illustrations from a standard textbook. They were not originally intended to demonstrate these points, and it is hoped that the reader will be the more forcibly impressed with the facts.

So far, nothing has been said about occlusion, and the method of obtaining the shape of the lower arch was only alluded to. Before the lower arch outline can be determined, a very important factor, the curve of Spee, must receive careful attention. In normal occlusion

FIG. 6.



do not claim that there is no difference between the appearance of the arches of the different races, for I perfectly agree with Dr. Stanton and other observers that such variations occur, but I maintain that the same formula holds true for the arches of any race.

If we consider that the racial and temperamental differences find their expression in the form and the relative sizes of the teeth, we can readily understand how the outline of the arch is influenced by such differences. The position of the canine determines whether an arch is considered relatively wide or narrow, and the location of the cuspid is dependent upon the relative mesio-distal dimensions of the crowns of the anterior and posterior teeth. If the anterior teeth are too large in comparison with the posteriors, the cuspids are pushed farther away from the median line along the anterior curve, and the arch will appear to be wide. If, on the other hand, the anteriors are too narrow, the arch will

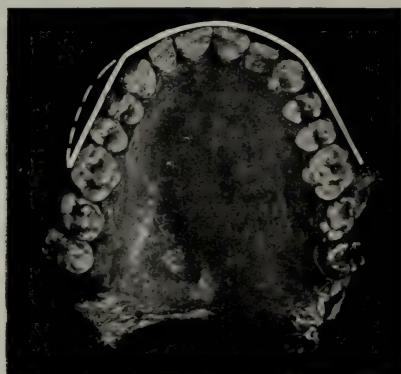
the disto-buccal cusp of the lower first molar falls just lingual to the buccal groove of the upper first molar, and the buccal cusp of the lower first bicuspid is directly opposite the contact point between the upper canine and first bicuspid. It is clear that the amount of tooth

the arc of a curve with its concavity upward, so that the lower teeth will lie on the greater curve. This vertical curve, for each arch, passes through the contact points of the posterior teeth (Fig. 8), and the average curve, which is parallel to and equidistant from those mentioned

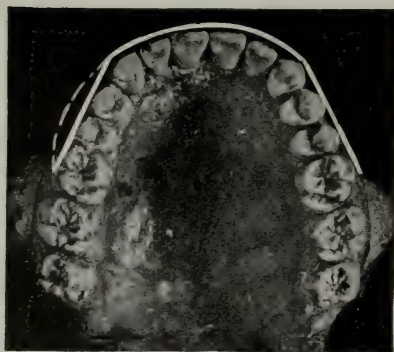
FIG. 7.



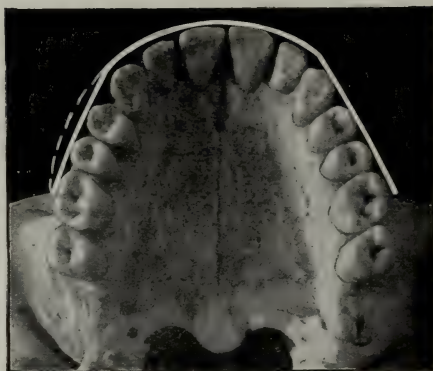
BILIOUS.



NERVOUS.



SANGUINE.



LYMPHATIC.

Typical arch outlines for the four basal temperaments. (From Turner's "Prosthetic Dentistry.")

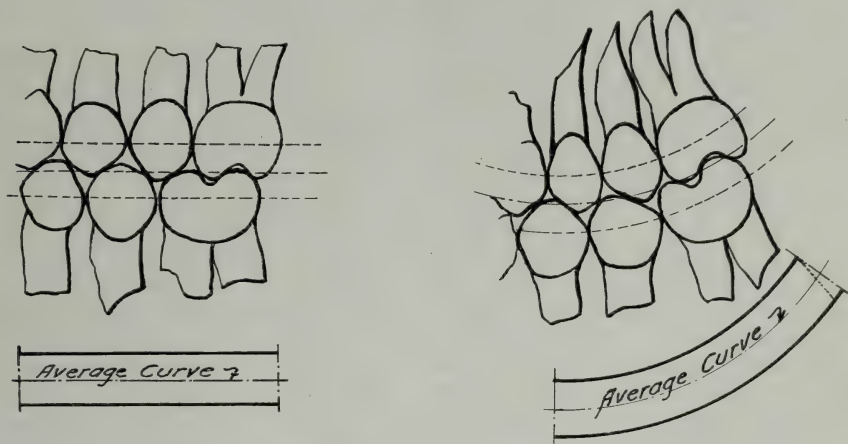
structure between those two points in both the upper and lower jaws must be so distributed that perfect occlusion is obtained. It is almost invariably found that the amount of tooth structure within those limits in the upper jaw is slightly less than that in the lower. Nature's method of correcting this is to bend the posterior part of the arch into

before, represents the curve of general occlusion, which is known to the profession as the curve of Spee. This curve has been considered to be a circle by many observers, but its true nature is unknown. If provisionally, we accept the supposition that it is a circle, or that it closely resembles a circle, its radius can be calculated by the formula which

has been derived for the radius of the anterior curve in discussing Dr. Stanton's method of arch predetermination. The curve of Spee does not materially affect the dimensions of the arch in the general plane of measurements, because

In order to determine the direction of the line for the posterior teeth, on a diagrammatic outline of the upper arch (Fig. 9) perpendicular lines are drawn to the line of the upper posterior teeth at points corresponding to the buccal

FIG. 8.



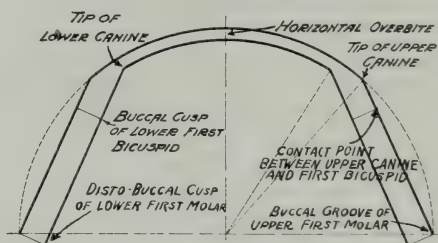
Showing the curve of Spee.

we must remember that by the process of bending, the curve of Spee is elongated, and this compensates partly for the tendency of its extremities to move nearer to each other.

Thus, the occlusion in the posterior part of the mouth, so far as the mesio-distal relations of the upper and lower teeth are concerned, has been taken care of. The method of placing the lingual cusps into perfect occlusion will not be touched upon in this article. In the consideration of occlusion in the anterior part of the mouth, the problem of overbite confronts us. The amount of overlap in the vertical direction may be disregarded for the present, but the horizontal overbite is a very important factor in the predetermination of the correct lower arch outline. It must, therefore, receive careful attention. The general characteristics of the upper arch, namely, that the six anterior teeth are situated on the arc of a circle, and that the teeth posterior to the tip of the cuspid are placed on a straight line, also characterize the lower arch.

groove of the first molar and the contact point between the canine and first upper bicuspid on both sides. Then the distances from the buccal cusps to the central fossae are measured on the first molar and first bicuspid teeth, and are

FIG. 9.



laid off to scale on the corresponding perpendicular line. The points thus obtained are joined by a straight line which is prolonged into the incisal region on both sides of the arch. This represents the line for the lower posterior teeth.

To locate the positions of the tips of the lower cusps, a distance correspond-

ing to the sum of the mesial half of the lower first bicuspid and the distal half of the canine is laid off along the line of the lower posterior teeth, anterior to the point where the perpendicular which was erected at the distal surface of the upper cuspid crosses it. The tips of the cuspid thus being located, a circle is drawn through them concentric with that of the upper anterior teeth. The difference between the radii of the upper and lower anterior curves represents the horizontal overbite, and as appears from the construction of the lower arch, it is a function of the mesio-distal diameters of the upper and lower canines and lower first bicuspid. It is not in direct relation with the dimensions of the incisors, except that the latter determine the arch outline, and for any given form of arch the horizontal overbite is a fixed quantity, whatever the ratio between the upper and lower anterior teeth may be.

The length of the lower anterior curve has not been considered in the construction of the arch outlines, and the question may be asked, How do I know that the lower incisor teeth will just fit in between the lower cuspid along the proposed curve? To answer this question I must confess that I have not been able to demonstrate this point mathematically, because this one dimension is not used in the construction of the arches. I have given an explanation for every step in the construction of the arch outlines except the very last one, but here I state that if the upper and lower anterior teeth are in perfect harmony the length of the proposed lower anterior curve will be exactly equal to the sum of the mesio-distal diameters of the teeth included between the tips of the lower cuspid. I have analyzed a very large number of dental arches, and only in exceptionally rare cases was there any

difference between these values. We know that Nature's tendency is to harmonize the upper and lower teeth, and if the graphically determined length of the lower anterior curve exactly corresponds to that calculated from the mesio-distal diameters of the teeth, then we can conclude that the arch outline obtained by this method is the one intended by Nature.

The predetermination of the correct arch outlines is extremely important before the treatment of any case is begun. Any doubt as to the possibility of obtaining perfect occlusion will be eliminated, and very useful information may be gained in those cases where the teeth in the two jaws do not harmonize. The correction of malocclusion can be performed with certainty, and the required final result can be accomplished in the shortest possible time. The method just described is simple, and it takes but a few minutes to obtain the necessary information after the teeth are measured, especially if the calculation of the radius of the upper anterior curve is eliminated by tabulating the radii corresponding to the different measurements of the anterior and posterior teeth.

In this article I have shown that a method in which an average overbite is selected will not give reliable results, and cannot be used for the predetermination of arch outlines, notwithstanding the fact that occlusion of the posterior teeth is established; and a simple method is given for the nearest approximation of the normal arch outlines, which I devised in accordance with natural conditions.

In closing, I wish to express my desire to have the method which I propose put to a severe test by the profession, in order to verify the claims made for it.

1967 SEVENTH AVE.

Electrobiolytic Theory of Dental Caries :

The Determination of Factors in the Etiology of Dental Caries ; Comparative Studies of Osmosis and Conductivity with Regard to Electrobiolysis in the Mouth.

By PAUL R. MANNING, D.M.D., Springfield, Mass.

[SECOND PAPER.]

ANALYTICAL studies directed toward the solution of the basic causes of dental caries, as indicated in the earlier paper,¹ have disclosed the operation of definite physical forces. The manner of operation of these forces is of exceedingly intricate nature when viewed in all the modifications of mouth conditions, yet their fundamental physical control is comparatively clear and well understood.

The summary of results of careful experiment based on speculative reasoning, in many cases guided by empirical and even accidental findings, shows that we deal rather with problems in physical chemistry² than with those life processes which, it appears, it were vain to attempt to analyze upon the basis of present elementary knowledge—with the tangible phenomena of which we have already some knowledge of the laws of operation—rather than finding any necessity to attempt to explain away the features of the appearance of caries

on the ground of consideration of “vital force,” which is at once the *petitio principii* of the careless student and the bane of discussion for the serious observer.

NECESSITY OF ANALYSIS OF FUNDAMENTAL CONDITIONS.

Let us not assume any unproved grounds in our inquiry. Many proposals have been put forth in regard to the etiology of dental caries which have held elements of important truth, but which have forfeited claim to consideration because in some basic particular they have “begged the question.” Let us consider the mechanism, the tissues, and the secretions involved, from the point of view of the analyst.

The mouths of mammals may be said to be accessory organs of digestion. In some cases certain other functions are fulfilled, such as the gathering of the food of grazing animals by clipping with the teeth. The tusk-like canines in carnivora appear to be specialized for destruction of the resistance of their prey when seized, and possibly also for combat. The tissues of the tusk of the elephant have also undergone specialized growth and modification for a special purpose.

In man, it may be said, the mouth is mainly specialized as an accessory organ of digestion, although its tissues do take part in the production of articulate

¹The introductory chapter was printed in the DENTAL COSMOS for January 1918, p. 26.

²The “new” physical chemistry, a science largely developed since the middle eighties of the last century, involves the elements of physics, inorganic and organic chemistry, and, in order to go far into the line of research, higher mathematics. The earliest and most extensive work has been on the nature of solutions, and it is with this that we are chiefly concerned.

speech. The mouth is a chamber with ports for communication without and within the body, either of which, through the mobility of certain of the tissues forming the chamber walls, may be closed at will. It is furnished with a hard, destructive mechanism, the teeth, for the division and comminution of food, with a mixing mechanism, the lips, cheeks, tongue, and soft palate, for the control of the food mass, a lubricating mechanism to render the food mass amenable to further manipulation and to carry therein digestive substances, and a governing mechanism or nerve supply.

The living mouth, then, in process of functioning, differs from the mouth of the dead subject chiefly in the latter two respects. It is lubricated, that is to say, there is a fluid kept there more or less constantly, and it is more or less subject to the function of its governing mechanism. It follows that the outstanding feature in the preservation of tooth tissues in skulls dating back through long periods of time, in which there is conclusive evidence that caries was active during life, and equally conclusive evidence that none occurred after death, is that these factors were present in the living individual, and missing in the dead subject. It is the writer's opinion that the loss of the factor of nerve control may be overlooked until we arrive at the consideration of modification of basic principles. The inference of connection between the presence of fluids in the mouth and the occurrence of caries is extremely interesting, and leads to speculation and experiment of the utmost importance. We are accordingly led to experimentation to determine the nature of the mouth fluids.

SIGNIFICANCE OF FACTORS RELATED TO THE APPEARANCE OF CARIES.

Much excellent work in the chemical analysis of the saliva has been already accomplished, and dentists in general are more or less familiar with the routine methods employed in that work. There are, however, features in the progress of the lesions of caries which it would be

well-nigh impossible to harmonize with the established ideas of results of chemical reaction in the general sense, but which, when viewed in the method of reasoning applied to the solution of problems in physical chemistry, appear not only natural, but are even to be expected or predicted upon analysis of the conditions. Certainly all of the features in the progress of caries invite further investigation from this latter point of view.

The principles of osmosis, diffusion, electrical conductivity, surface tension, and viscosity of solutions, and the general laws of the behavior of physical forces, are matters with which we must be as thoroughly familiar as possible before we may attempt to understand the forces at work in the lesions of caries. These principles, of which we have as yet but partial knowledge, are the groundwork upon which will rest much future study of mouth conditions, and it is through familiarity with them that some application of remedial or preventive measures will be possible.

DISCUSSION OF EXPERIMENTS IN CONDUCTIVITY AND OSMOSIS.

The observation of differences of electrical potential in the mouth, in experiments carried on by the writer since 1912, becomes more relevant in view of the research³ of the thirty or more years preceding to determine the relationship of the electrical conductivity, the concentration and viscosity of solutions, and the diffusibility of electrolytes in solution. As long ago as 1856 Wiedemann⁴ experimented on the conductivity of aqueous solutions of an electrolyte to the extent that he was able to conclude that *The conductivity of a solution is directly proportional to the concentra-*

³ Compare reports of Carnegie Institution, Washington, D. C.: Pub. No. 63, A. A. NOYES *et al.*, "Electrical Conductivity of Aqueous Solutions."

Pub. No. 80, H. C. JONES *et al.*, "Conductivity and Viscosity in Mixed Solvents." Also Pubs. Nos. 170, 186, 198, 210, 230.

⁴ G. WIEDEMANN, *Pogg. Ann.*, 99, 229.

tion and inversely proportional to the viscosity.⁵ This may be expressed thus:

$$\frac{Kn}{p} = \text{constant},$$

in which K is the conductivity, n the viscosity, and p the concentration of the solution.

It is seen that the relation of viscosity and concentration of solutions of electrolytes to their electrical conductivity is not a new discovery. The work cited is but that of a single pioneer. Investigations have been carried on in Europe through a period of over sixty years to determine the nature of ionic activity of solutions. In this country, during the past thirty years, exceedingly elaborate experiments have been made for the purpose of determining the relationship of the various conditions affecting the activity of the ion. To these efforts we must pay tribute for the results obtained, for the ingenuity of some proofs and methods of obtaining them, and for a splendid and apparently untiring devotion to a baffling problem.

Upon discovery of evidence of electrolytic action in the mouth the writer began an investigation of the nature of the saliva as a solution of electrolytes, also experiments to determine the permeability of the tooth substance under osmotic pressure.⁶ Of the difficulties attending anything like an accurate and thorough quantitative determination one may

judge from the complex nature of the saliva and also from the difficulties in general experienced in this work.

Qualitative determinations of the penetrability of tooth substance under osmotic pressure, with and without adjuvant action of the electric current, are made with comparative ease. On account of the important indications of these tests we may for the moment forego an elaborate dialytical study of the mouth fluids and the teeth from a point of view of exact measurement. It is rather our purpose here to define the forces in operation than to present a finished tabulation of measurements of osmotic pressures and differences of electrical potential developed in the mouth.⁷

THE NATURE OF THE SALIVA.

The saliva is a mixed solution secreted into the mouth from three pairs of glands. It may be said to have a some-

⁵ As to the importance of universal attention to the study of mouth conditions:

It appears that tables of computation or too great a degree of formality in the consideration of a subject is undesirable to the busy practitioner. The writer has received so many communications on the subject of the first paper since its publication, the tenor of which, with few exceptions, indicates that a speedy announcement of a remedy for the lesions is much more acceptable than any groundwork to that end, so that it has been thought advisable to avoid discussion of certain of the technical difficulties in the line of research, in order to gain wider interest in the somewhat general consideration of a matter of great importance.

That the sole advance in dentistry in the period of its growth has been in the perfection of appliances and technique for remedial purposes, while the only preventive measure of note brought into favor has been that of cleanliness, which should have been spontaneous in any event, should sufficiently plead urgency for the scientific, orderly consideration as to whither all this labor leads. Balanced against the multitudinous operations devised and the incalculable energy spent in dental patchwork, however skilled and beautiful that work may ever become, the preventive measures which should be our greatest aim are found sadly wanting in weight.

⁵ The viscosity of a liquid is expressed as the force, in dynes, necessary to move a layer of the liquid one molecule in thickness and of the unit area, 1 sq. cm., over another layer of the liquid at a unit velocity of 1 cm. per sec. The symbol n is used to represent the coefficient of viscosity. The fluidity of a liquid is expressed as the reciprocal of its viscosity.

⁶ Experiments show that there is a force operative in solutions which tends, in cases of varying concentrations, to establish a state of equilibrium. Layers of solutions of diffusible substances do not remain as layers, but the dissolved substances appear driven from the regions of higher concentration to those of lower density. The force is termed osmotic pressure.

what indefinite reaction, but it appears, in conditions of health and when rid of carbonates, faintly alkaline. Its specific gravity is by no means a fixed figure, and is commonly variable from 1.002 to 1.006. The total solids by weight are from 0.5 per cent. to about 2.5 per cent. maximum. It is composed of water, organic substances, ferments, inorganic salts, gases in solution, and débris. It is a lubricant of the mouth tissues and of the food mass, and it is a vehicle for digestive substances. It is normally present at all times during life, its flow being more or less constant. The amount secreted in twenty-four hours by an adult is estimated at from one to one and one-half liters. Heidenhain* appeared to prove that the content of water and salts, on the one hand, and of organic constituents, on the other, are controlled from different sources. This seems to be the only interesting feature, from an analytical standpoint, concerning the nerve control of salivary supply.

Of the organic constituents, mucin is that which imparts the mucilaginous quality to the saliva. It is chemically a glyco-protein, or protein distinguished by combination with a carbohydrate group. It is of colloidal nature, and appears incapable of exerting osmotic pressure.

The saliva contains inorganic salts, potassium and sodium chlorid, sodium and calcium carbonate, calcium phosphate and potassium sulfate, which are diffusible, and may be classed as crystalloids. These salts in even weaker solutions than the saliva are capable of exerting definite osmotic pressures. Comparatively simple experiments suffice to show their behavior against permeable and semi-permeable membranes.

THE NATURE OF THE TEETH.

The teeth of man may be considered as hardened specialized epithelium supported by a calcified pillar built upon a connective tissue matrix.

The enamel or ectoblastic layer is de-

veloped in an orderly way, so that its appearance when complete shows a fairly uniform texture throughout. Its high mineral content (97 per cent. by weight, in the adult) accounts for its extreme hardness. In youth, according to Hoppe-Seyler, the amount of animal material is from 15 to 18 per cent. The nature of the remnant of the enamel organ (*cuticula dentis*, Nasmyth's membrane) has been discussed but not wholly determined. It is of great interest from the point of view of comparative anatomy.

The crystalloidal nature of the mineral salts composing the hard portions of the teeth is worthy of note, and the high mineral content has led to tests of the ability of these substances to form poles in a circuit of electrical flow. The enamel has not been examined to an extent to determine whether by virtue of selective affinity it is capable of absorption and transference through its substance of liquids or gases. The writer has not found it appreciably penetrable under osmotic pressure, but, from the nature of the material, predicts that with care and the proper facilities, semi-permeable membranes may be prepared from thin enamel plates.

Experimentally, the writer has found that plates of enamel immersed in a solution of electrolytes are capable of assuming and maintaining a polar quality, and an appreciable amount of electrical charge may be perceived in the region of such a pole. The significance of the observation of electrolytic action about a pole composed wholly of enamel is that electrolysis may occur at any time when enamel is immersed in a solution of electrolytes together with another body of sufficiently dissimilar mineral content to cause a grouping of ions to form polar charges.

The dentin is composed of a bony substance developed upon a soft tissue matrix from the mesoderm, and showing in its completion many little spaces of tubular form, filled with structures which, one may assume, are at least partly colloidal. The substance lying between the tubules appears but little differentiated from bone.

* Heidenhain's "Theory of Trophic and Secretory Nerve Fibers," 1878.

Dentin which is decalcified with acids yields up the tubule walls (sheaths of Neumann) last, on account of the high density of this portion of the dentin. The remaining matrix of fibrous connective tissue answers typically to colloidal reactions. When water which has been slightly acidulated is added, this substance undergoes swelling. When boiled for two days it has yielded gelatin.

As has been already pointed out, the activity of colloids in acidulated media seems to bear upon the appearance of the lesions of caries in many respects.⁹ One might assume that with the striking effects of slightly acid reaction upon such activity, and also upon the course of electrolytic dissociation, there is a likelihood that the ability to control the reaction of the mouth fluids would be desirable.

That the dentin as grossly considered may be regarded neither as crystalloid nor colloid alone, but as a peculiar combination of both, is borne out by experiment. Upon the basis of such experiment the nature of the matrix of cavity decay might be predicted fairly accurately as incapable of showing any of the properties of an electrolyte whatever.

In tests of permeability¹⁰ the writer

⁹ DENTAL COSMOS, vol. ix, 1918, No. 1, p. 27.

¹⁰ Thomas Graham, a Scotch chemist, first took up the study of the laws of diffusion. He noted that diffusion of liquids and gases takes place through porous solids (plaster of Paris plugs and compressed plates of plumbago), and that the force which induces such passage is sufficient to maintain a pressure on one side of the septum. He found that the septum need not be porous; that carbon dioxide escaped through the walls of a soap bubble, and that vulcanite septa could not exclude hydrogen gas. It is known that hydrogen can be made to pass through iron and palladium at high temperatures, and through platinum at ordinary temperatures.

In 1875 Kohlrausch established the fact that the conductivity (electrical) in aqueous solutions of electrolytes increases with the temperature, an idea which may be formulated thus:

$$\lambda_t = \lambda_0 (1 + \alpha t),$$

where λ represents the molecular conductiv-

used plates of dentin from freshly extracted teeth, prepared as carefully as possible to 0.25 mm. thickness. These were carefully sealed in a contrivance consisting of a pair of threaded collars supplied with flanges about concentric apertures for grasping the specimen. With screw force the parts were sent together gently but firmly, the greatest care being taken to avoid fracture of the specimen and consequent "leakage" of the solutions.

The septum having been thus prepared was soaked in distilled water for two days in one case, and in another it was led directly into the tests. The membrane was placed in position by means of connections supplied on its frame with a solution of an electrolyte on one side and with distilled water on the other, both of which were in calibrated burets. In an average of eight days for the series of experiments it was possible to determine that water passed through the septum in the direction of the solution of the electrolyte. The rate of flow was so variable and the number of tests so low that it would be unwise as yet to attempt to make an estimate regarding the time factor as compared to the development of osmotic pressure. As we have been unable to obtain a diffusion of salts through the dentin plates, we must for the time conclude this substance to be but semi-permeable, at best.

Next, the passage of an electric current through the septum was tested, and the development of higher osmosis, together with an increased resistance to the current after a time, were noted. Beyond these qualitative findings it will be necessary to determine definitely osmotic pressures in saliva and the relation of

ity, t the temperature in a given case, and α is the constant.

Arrhenius demonstrated that there is a temperature of maximum conductivity, beyond which point there is a diminution. It is interesting to note that in his experiments on phosphates (hypophosphorous acid and phosphoric acid) he found the temperatures of 55° and 75° respectively for points of maximum conductivity.

varying viscosities in that fluid to its conductivity.

COMPARATIVE DEDUCTIONS.

That the teeth, in development at least, are homologous with the dermal appendages, hair, scales, claws, and nails, is accepted. It must be noted that for these somewhat allied structures there is no lesion corresponding to dental caries. In both cases development is from two primitive layers. Those parts of the hair and nails derived from ectoderm are preponderant in bulk, while the mesodermal portion constitutes only the matrix or papilla. In the teeth (of mammals), on the other hand, the ectodermal portion is always of relatively small bulk and in many cases wanting, the mesodermal derivatives forming the dentin and the cementum, or the bulk of the tooth. In a manner this is—for the question—a minor difference, and capable of affording little explanation. On the other hand, the characteristic differences of high calcification of the teeth and the continual presence of a mixed solution of electrolytes about them¹¹ cannot help but be coupled with the appearance of a lesion which has no homologue.

TECHNICAL CONSIDERATION OF THE FACTORS WHICH APPEAR TO EXALT DESTRUCTIVE PROCESSES.

The typical appearances of the lesions of dental caries are among the first impressions registered upon the mind of the beginner in clinical experience. The attention which he comes to bestow upon "likely" places for the appearance of decay is the result of a striving, subconscious, continued observation in the

search for cavities. In considering typical appearances, let us attempt to classify from a physical point of view:

Group A: Cavities appearing in regions of naturally formed developmental markings or fissures of the teeth. In this group the remarkable features are—
(a) That in order to grant the inception of caries it has been necessary for a part of the surface structure to give way, the part first dissociated often being so very minute as to contradict the possibility of its being a site or point of entry of any gross process. (b) The appearance of discoloration. (c) The destruction of consolidation and the gross failure in continuity of the part.

Group B: Cavities appearing on flat, smooth, broad, regular surfaces. Under this head the extreme difference becomes apparent between progress of caries upon enamel alone and progress where adjacent dentin is exposed with the enamel. Enamel alone shows for great lengths of time high resistance to the dissociative forces, while enamel and exposed dentin adjacent in sheltered places (*i.e.* not worn masticating surfaces) is more often the site of comparatively rapid dissociation. (a) Cavities which, by their position, are shielded by the major tissues of the mouth (cheeks to some extent, as in buccal cavities, lips, tongue rarely, gums especially, through the retention at their edges of a fillet of moisture and by virtue of the high surface cohesion of mouth fluids). In this connection the index of surface tension for mouth fluids is a very interesting figure, variable even when specific gravity and chemical composition are uniform. (b) Cavities so located that there appears to be a constant bathing of some of their margins by fluids held upon them by filleting or filming due to their property of surface tension, or by capillarism. This group includes approximal, gingival, to a certain extent buccal, and, in the case of deeply formed fissures, fissure cavities.

SUMMARY.

To summarize, we have found—

(1) That the presence of moisture is essential to the inception and progress of caries.

¹¹ The theory that a clean tooth will not decay attained at one time widespread belief. It seems, indeed, that in a majority of cases cleanliness is a relative factor, although it now appears that it works in a different course from that which it had been supposed to take. A revision of the phrase would make it "A dried tooth will not decay," and as this condition cannot be secured, it would appear that we must be content for the time with alleviative measures.

(2) That the teeth contain high percentages of material capable of great ionic activity.

(3) That the saliva is a solution of electrolytes.

(4) That the dentin is semi-permeable under conditions favorable to the development of osmotic pressure.

(5) That the enamel appears capable of assuming an electrical polar quality when immersed in a solution of electrolytes.

ALLEVIATION OF THE EFFECTS OF OSMOTIC PRESSURE AND ELECTRICAL CONDUCTIVITY IN THE MOUTH.

Adequate means to counteract the dissociative physico-chemical forces at work in the production of the lesions of dental caries can never be brought into operation by the usual method of *removal of cause*. We deal with immutable compounds of Nature.

We may consider the attenuation of the dissociative forces by many means. The following may indicate our possible work to control these forces:

(A) Attempts to break up the processes by agitation, interchange and drying out of the fluid. This measure would be habitual, in the control of the individual. It has been tried in many cases by the writer, with apparent success wherever there has been the factor of the individual's co-operation.

(B) Studies of the saliva and of the glands from the point of view of physico-chemical activity.

(C) Studies of the control of the reaction of the saliva and of the effect of such control.

(D) The intentional shunting or short-circuiting of all operative interference where foreign bodies are allowed to remain in the mouth.

That many effective means of combating an ill which appears to have inconvenienced the race greatly throughout its existence are soon to appear, it is reasonable to hope. Scientific research could find no higher aim than the attainment of such result.

387 MAIN ST.

Mankind's Greatest Benefactor.

By GEORGE B. POTTER, Hartford, Conn.

THE poet, with deep insight into the vagaries of human nature, left us these exquisite lines that we might endure our disappointments more philosophically and deal with our neighbors more charitably:

Full many a flower is born to blush unseen,
And waste its sweetness on the desert air.

The fragrance of Horace Wells' courage and intellect, and the love he felt for suffering mankind, has not been dissipated without achieving its magnificent goal. The boon he left to posterity is, without doubt, the most priceless that has ever been willed from one being to others. It has certainly borne more fruit in mitigating the agonies of suffering humanity than any other heritage that has been bequeathed by man to his descendants. How piteously and with what irony was the credit of his discovery juggled from him while he lived! and, after his early death, how grudgingly has a small portion of the honor been bestowed upon his almost forgotten name! The desert of man's unwillingness to believe, and his reluctance to accredit on being compelled to see, crowded the short space of Horace Wells' noble life with frustrated hopes and unfulfilled dreams. This man—whose narrative is vaguely known to a very few, mostly within the professions of medicine and dentistry—discovered, demonstrated, and proclaimed the blessings of anesthesia seventy-five years ago. The city in which he quietly lived jealously clings to the renown which his name has afforded it, yet there are but few within its confines who can tell just where he resided, or from what forgotten doorway his remains were carried to their unwept

resting-place. There still remains a perplexing doubt within people's minds. Though they eagerly lay claim to the honors which reluctantly attend his name, they seem almost to doubt the existence of the man himself. They allow the tangible results of a man's genius, but are uncertain as to his identity.

In the year 1834 Horace Wells left his home in Hartford, Vermont, and went down to Boston to fit himself for the profession of dentistry. He was a handsome young man of nineteen, with thoughtful, kindly eyes looking inquiringly out from beneath a broad, deep forehead. His mouth disclosed a nature teeming with love and compassion, his firm chin an unflinching steadfastness of purpose. His temperament was a rare mingling of the dreamer and accomplisher. For two years he pursued his studies in Boston, then journeyed to Hartford, Conn., where he opened an office. In the first volume of the Hartford City Directory, published in 1838, one will find this characteristic notice: "Horace Wells, Dentist, will faithfully perform all Operations on the Teeth at his Rooms under Union Hall. Entrance No. 162½ Main St." These carefully selected words finely portray the man. He never promised more than he could fulfil, and faithfully discharged every obligation into which he entered. Living at No. 4 Spring st., he was happily married, and conducted a successful practice for three or four years, esteemed by all whom he met, both socially and in a business way.

In the summer of 1840, Horace Wells expressed the opinion to Linus P. Brockett, M.D., that a method of painless surgery would some day be discovered.

This is proof that his mind, occupied with the vital question of lessening the suffering of unfortunate ones, conceived the idea of mitigating pain throughout the world. At this time he had not applied the conception to dentistry, but had with rare intuition discovered the goal of anesthesia, little realizing that his own profession would serve as the setting for the great denouement which medical and chemical professors had for years been awaiting. As far back as 1800, Sir Humphry Davy made a series of experiments with nitrous oxid, after it had been discovered by Dr. Priestley, but for forty-four years no one had grasped the great truth, nor had dared put the matter to a test, although Davy had once breathed the gas while suffering from an erupting third molar, finding the pain more severe after the experiment.

Early in December 1844, Prof. G. Q. Colton came to Hartford to give a course of lectures on chemistry and natural philosophy. As a means of arousing interest and curiosity he arranged an exhibition of the effects of laughing-gas upon anyone in his audience who might offer himself for the test. On December 10th Dr. Wells attended the lecture, and inhaled the gas, much to the chagrin of his wife, who was with him. On the way home she scolded him for his foolish antics while under the influence of the gas, reminding him that neighbors' remarks might prove hurtful. But her husband did not attend the lecture and inhale the gas merely to provide entertainment for the public. He went to carefully watch the experiments and to consider the effect upon himself and others. His naturally creative mind was busy, and he was peering into the blackness of ignorance seeking the light of truth. He found it! At this particular lecture a Mr. Cooley had inhaled the gas, and while running about the stage had badly bruised one of his legs against a wooden settee. Dr. Wells asked him if he was hurt. He replied that he had no knowledge of it, but on looking down discovered his injury and saw the blood flowing from it. Dr. Wells then re-

marked, "I believe a man by taking that gas could have a tooth extracted or a limb amputated and not feel the pain." Thus was the light seen, dim and distant to be sure, and still clouded with doubts which were destined to grow by petty jealousies into bitter controversies until they wrested the honor of discovery from its rightful owner. And not until our day has his name received the credit due it.

After the lecture, a lengthy discussion followed at Dr. Wells' office as to the advisability of operating upon anyone while under the influence of the gas. Doubts were expressed as to the wisdom of such a course—whether it would be justifiable or safe to the patient. Horace Wells was confident of success, and with characteristic fearlessness offered himself as a subject for a trial operation. On December 11, 1844, in the presence of Prof. Colton, Mr. Cooley, and Dr. Riggs, who was a student in his office, Wells sat down in the operating chair and voluntarily inhaled the gas which Prof. Colton had supplied. He became unconscious. While in that state Dr. Riggs extracted an upper third molar. Upon regaining his senses he announced that he had not felt the least pain, and declared that a discovery of immeasurable value had been proved a fact. When others doubted or merely dreamed, Horace Wells acted, taking the responsibility upon himself in his eagerness to prove his contention. By so doing he gave the world the greatest boon it could have received.

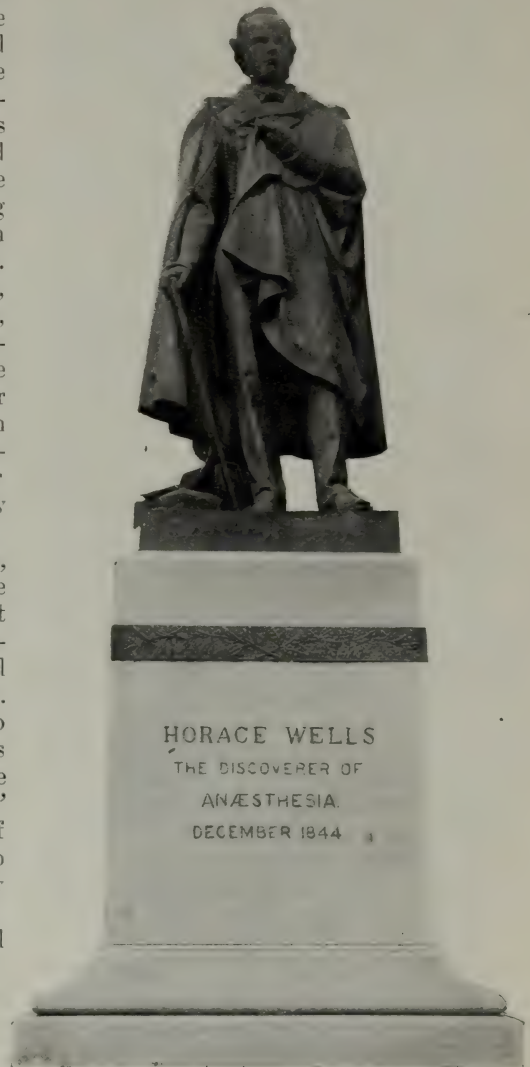
The fruits of his belief and sacrifice were not destined to return to Horace Wells. Though he cared nothing for the fame which his discovery might bring, and never for a moment considered exploiting it, he became temporarily discouraged at the skepticism, the petty arguments, and the efforts of one or two men who sought to gain the credit of his achievement for their own material advantage. He wished only to relieve suffering, to demonstrate the feasibility of his methods so that every surgeon might see and believe, and every sufferer might partake of the balm he freely offered. With this purpose in view he gave his

attention exclusively to extracting teeth, aided and steadfastly championed by Dr. Riggs, whose name comes down to us in connection with pyorrhea, a treatment for which he discovered and successfully applied. In January 1845, Dr. Wells went to Boston, prepared to substantiate his claim with convincing evidence and demonstration. At the medical college he addressed the young men and afterward extracted a boy's tooth, using gas in the operation. The trial was doomed to failure. While taking the gas, the boy made an outcry, but upon regaining consciousness said he had felt no pain nor knew when the tooth was extracted. The students, with minds prejudiced, and feeling their importance as judges, hissed, and pronounced Dr. Wells a humbug. No one of the surgeons of the Massachusetts General Hospital, nor any medical or scientific man of Boston placed enough credence in Sir Humphry Davy's suggestions to recall or mention his statement of nearly fifty years previous.

At this point, Dr. Wm. T. G. Morton, who had studied in Boston at the same time with Dr. Wells, conceived the adroit plan of making use of his friend's discovery. At first he ridiculed Wells, and with the earnest help of Dr. Chas. T. Jackson, gave much labor and time to attacking the new methods of painless tooth-pulling. These men pointed the finger of mockery and cried "humbug," determined to break upon the rocks of derision any man from the country who supposed the wise men of the city credulous enough to believe his story.

Returning home, Dr. Wells passed through a period of inertia and discouragement, although the citizens of Hartford supported his claims and were eager to testify in his behalf. In those days there was neither hospital nor medical journal to advertise the great discovery; thus for two years were the blessings of anesthesia withheld from the entreating hands of the wretched. Meanwhile, Drs. Morton and Jackson, having secured the knowledge they needed, commenced giving gas in their practice, and their work met with such

success that, in the fall of 1846, two years after Dr. Wells had deliberately offered himself as a subject, the papers of Boston proclaimed them the "in-



HORACE WELLS

THE DISCOVERER OF

ANÆSTHESIA.

DECEMBER 1844

ventors and discoverers of a compound which, by breathing into the lungs, induced so deep a slumber as to enable them to perform the most painful surgical operations with entire unconsciousness on the part of the patient." Now, of course, Boston surgeons were

thoroughly satisfied. They proclaimed Drs. Morton and Jackson world benefactors, and made plans to aid them in spreading the great news broadcast. These two usurpers of Horace Wells' crown began figuring the money value of their "discovery." Dr. Jackson took out a patent, but fearing the wrath of the medical society on the score of unprofessional conduct, assigned all his right and title to Dr. Morton, the latter, however, to pay him 10 per cent. of all the profits; this was later increased to 25 per cent. Advertisements and circulars were scattered about; agents traveled in all directions to sell rights. Prices were based on the population of cities, towns, or villages, and all who sought relief were first requested to pay for the privilege.

Horace Wells stood aloof, watching the money-mad as they coined suffering and pain into silver and gold. Quietly he went his genial way, lending a sympathetic hand or letting fall a cheering word—his heart heavy, however, with the world's suffering and his own disappointments. Early in 1848 he died while on a visit to New York. He had lived but thirty-three years. From a little, white-porched house on Trumbull st., Hartford, his body was carried to its resting-place, and his name seems to have gone with it, almost lost amid the clouds of doubt, reluctance, and spitefulness. As the light of a newborn star reaches our earth only after years of persistent traveling, so the pure ray of Horace Wells' nobility, love, and God-given imagination, may at last so shine upon the hearts of those who follow after us that they will feel its genial warmth and bless the name of the superman, the ideal American, who having beheld a great vision, awoke and offered himself

as a possible martyr that the suffering of mankind might be alleviated.

The incalculable value of Horace Wells' discovery can be best grasped if we view it in the murky light of today's war-torn world. What would be the agony of the thousands of wounded if anesthesia and its improvements were unknown? What would be man's dread and fear on going into battle, mind-tortured with the thoughts of coming wounds and mutilations, or operations without the gracious sleep of anesthesia? Its influence upon warfare, upon mankind, and upon civilization cannot be measured.

One wreath was early placed upon the tomb of Horace Wells by a people we esteem for their courage, fidelity, and love—the French. The Medical Society of Paris in January 1848 voted that "To Dr. Horace Wells of Hartford, Conn., is due all the honor of having first discovered anesthesia." The State of Connecticut in later years erected a statue in Bushnell Park commemorating the great discovery. On the fiftieth anniversary of his era-making operation a commemorative tablet was placed on the front of the building at the corner of Main and Asylum sts. On it one may read:

TO THE MEMORY OF
HORACE WELLS, DENTIST
WHO UPON THIS SPOT
DECEMBER 11, 1844
SUBMITTED TO A SURGICAL OPERATION
DISCOVERED
DEMONSTRATED AND PROCLAIMED
THE BLESSINGS OF
ANÆSTHESIA

222 N. BEACON ST.

To What Degree are Oral Pathological Conditions Responsible for Systemic Disease?

By PERCY R. HOWE, A.B., D.D.S., Boston, Mass.,

ASSISTANT PROFESSOR OF DENTAL RESEARCH, HARVARD UNIVERSITY; CHIEF OF RESEARCH LABORATORY, FORSYTH DENTAL INFIRMARY FOR CHILDREN.

(Read before the fiftieth anniversary meeting of the Pennsylvania State Dental Society, Wilkes-Barre, April 23-26, 1918.)

I SHOULD like to make it clear at the outset that all oral septic conditions should be cleared up, but it is questionable whether or not by so doing we are eradicating all or any large percentage of present or future disease. It is the ready acceptance and the extensive adoption as a basis of practice of the focal theory of infection as related to the teeth that makes it imperative for us to thoroughly examine into its stability.

One authority states that 85 per cent. of the surgical cases of his clinic are directly traceable to the teeth. In New York City it is recommended that in the school clinics all pulpless teeth be extracted in order to safeguard the health of the children. A long and varied list of diseases has been attributed to the teeth by such writers. One of them states that there is no limit to infections from this source. Still another says, "A man is in superb health by reason of his healthy mouth." To these men the mouth appears to govern a large percentage of disease and to preside over health.

If this theory is sound, if it is founded upon clear and direct evidence, if it has stood firm under clinical tests and has needed no modifications or fine-drawn theories to support it, then the dental disturbances that we have regarded as minor, and as having but comparatively little influence upon the rest of the body, have suddenly become the first cause of a large percentage of disease. Wholesale

extraction is demanded; an edentulous condition can be the only safe one, and dentistry stands condemned.

In an estimate that I have compiled from examinations at the Forsyth Dental Infirmary for Children, where in 50,000 cases there were more than 40,000 abscessed teeth, often ten abscesses in one mouth, I have been able to find no record whatever of the most frequent and entirely obvious affliction attributed to the teeth, namely, arthritis deformans. Nor have I found any rheumatic conditions thus attributable. We may feel that in the case of children at least, if this theory holds true at all, it holds true only in very rare instances. It is quite the exception—certainly not the rule.

The heads of some of our largest and best hospitals where this theory has had a trial have admitted that cases of general diseases in which the teeth could be considered a factor have been extremely rare—a further indication that the full explanation of all these diseases does not lie here. The theory seems to be evidence of a peculiar and limited insight into disease.

Dr. Theobald Smith, in an address upon research, has said that "Perhaps one of the most important functions performed by laboratory research is the repeated demonstration of the essential unity of the body as an organism, the absolute interdependence of the various organs and tissues of the body, and the uniformity of their defensive methods

against external, foreign, and injurious agents." According to this statement he apparently believes that the mouth is not peculiar in its function of presiding over health. The mouth is but a part of the co-ordinated human organism, and is subject to the same general principles which apply to all parts.

One distinguished man has aptly said, "We still have twenty-five feet of intestines and five inches of mouth, not twenty-five feet of mouth and five inches of intestines." Another, after examining the teeth of the soldiers in the British army, has stated that if the teeth had much to do with disease the whole English race would have been exterminated long ago.

If these latter and more comprehensive views are correct, then we have done wrong in extracting teeth extensively, and in permitting the physician to make a scapegoat of the teeth in an effort to deal with diseases about which no one as yet knows much. But let us examine this theory.

The scientific authors of the idea that the teeth are the first cause of numerous pathological conditions are that group of bacteriologists who have made an especial study of the streptococcus. They have selected the streptococcus viridans as the causative agent. This micro-organism is an organism of low virulence and is non-hemolytic. The mere presence of this micro-organism in a pyorrhea pocket and in a gastric ulcer convinces them that the pyorrhea is the cause of the gastric ulcer. On such evidence it is just as reasonable to state that the gastric ulcer causes the pyorrhea. The mere presence of the micro-organism amounts to nothing, for it is also present in healthy mouths. The streptococcus viridans is a constant inhabitant of the mouth, diseased or healthy, and does not attack healthy tissue.

Another fact that is considered evidence that the streptococcus viridans is the micro-organism responsible for many diseases is that certain significant pathological conditions occur when it is repeatedly¹ injected intravenously² and in large doses³ into susceptible animals.

The most common effect is an arthritic condition. This experimental arthritis in rabbits possesses points of similarity with acute articular rheumatism in man, but it is not agreed that the two are identical. Streptococcus viridans is not the only organism capable of producing arthritis in rabbits. Pneumococci, meningococci, staphylococci, hemolytic streptococci, gonococci, *B. mucosus capsulatus*, diphtheroids, and many other micro-organisms will produce the same effect.

There is no agreement among those who believe in the infectious theory of arthritis. Poynton and Paine have isolated a short chain streptococcus from rheumatism. The advocates of the theory under discussion believe this to be streptococcus viridans. The French school have isolated a Gram-negative bacillus from arthritis. Others believe rheumatism to be due to a mixed infection of cocci and bacilli, perhaps not even specific; still others, that it is caused by common pyogenic bacteria.

Nathan⁴ in an excellent treatise upon the subject has given the result of his study of the various organisms connected with arthritis deformans. He does not mention streptococcus viridans at all, but a hemolytic streptococcus.

The infectious theory, however, is not the only one advanced to account for arthritis. Aseptic arthritis may be produced, and it may be produced in a number of entirely different ways. Oxhausen⁵ says trauma, known or ignored, is the cause of arthritis in children. Sever⁶ states that in pneumococcal arthritis trauma precedes the infective process. Wollenberg⁷ maintains that sclerosis and vascular obstruction, partial or complete, is always found, and indeed is the direct cause of arthritis deformans. After a study of the rôle of the nose, throat, and accessory sinuses in the etiology of arthritis in sixty-one cases, Hammond⁸ concludes that "general condition" is the etiological factor. Rea Smith⁹ examined eighteen cases of arthritis deformans with the fluoroscope, and found in each case cecal impaction with ileal stasis as well. "The microbic

invasion is secondary to the lowered resistance resulting from the toxemia." Pemberton,¹⁰ in metabolic studies upon arthritis, concludes that "Cases showing unmistakable and obvious sources of infection in teeth, tonsils, or elsewhere may improve or entirely recover upon a dietary regime." Arthritis may be produced by a constipating diet, as shown by the studies of McCollum and Pitz,¹¹ by Pitz,¹² and by Jackson and Moore.¹³ I have repeated these experiments in order to observe the effects upon dental tissues. The teeth loosen, the gums bleed, and at times pus forms. Upon removal of the impacted cecal mass the animals recover, the teeth tighten, and the arthritis disappears.

Arthritis is a common sequence to many other diseases. Nathan⁴ says, "I think we must for the present, at any rate, conclude that in the majority of cases the cause of chronic non-suppurative joint disease is an infection. The question as to the exact nature of the invading organism must remain doubtful in many cases." He says further, "Though it is not unlikely that a focus in a tooth is sometimes" (sometimes is not often, nor always), "and one in a throat is often, the point of entry for the bacteria, it should be remembered that once the micro-organism has entered the blood its connection with the portal of entry ceases. For this reason the removal of the infected teeth will have absolutely no influence upon the joint condition as it already exists." In his treatment he advocates strongly the use of the thymus gland for its *very beneficial effect upon nutrition*. "It nearly always leads to more or less complete recovery." So that while he theoretically leans toward the infective idea, in treatment he relies upon nutrition for cure.

Another disturbance attributed to the teeth is gastric ulcer. Concerning the cause of this we also find a diversity of opinion. Steinharter¹⁴ produced typical peptic ulcers by the injection of staphylococcus and a weak acetic acid solution. Staphylococcus alone produced abscesses which healed in from four to six days. Acetic acid alone produced more or less

edema. Mann,¹⁵ by the removal of the suprarenal glands, produced gastric ulcer in 90 per cent. of his cases. Hardt¹⁶ produced acute gastric ulcer by the injection of *B. coli*, and did not confirm the work of Rosenow with streptococcus. Elliot and Henry¹⁷ produced traumatic gastric ulcers. Durante¹⁸ says that gastric ulcers may be produced by any agent capable of damaging the sympathetic nervous system. Friedman and Hamburger,¹⁹ in experimenting with gastric ulcer in dogs, produced ulcers in three ways: By injecting streptococcus, staphylococcus, *B. coli*, and pneumococcus. By injecting diphtheria antitoxin, silver nitrate, liquor formaldehyd, nicotine, etc., by excising pieces of gastric mucosa, by tying off gastric arteries, and by injecting various emulsions in different gastric vessels.

Rosenow²⁰ caused gastric ulcer and appendicitis by injecting streptococcus. He believes that these diseases are due to embolism following the entrance of the micro-organisms into the circulation from a primary focus, not by swallowing the micro-organisms. Bertram²¹ says that for half a century it has been recognized that a peptic ulcer forms when a circumscribed area of the stomach loses its normal resistance through malnutrition or neurosis to the digestive effect of the gastric juice, and is digested. Burge and Burge²² assert that decreased resistance of a circumscribed area of the stomach to gastric juice due to a decreased oxidative process of the cells of the area, followed by subsequent digestion of the area by pepsin, is the explanation of gastric ulcer.

Experimental studies in the production of chronic gastric ulcer by Wilensky and Geist²³ consisted of making incisions in the wall of the stomach, followed by the injection of streptococci from human gastric ulcers. Nine animals were used, and in all, irrespective of the size or depth of the defect or of the virulence or number of the organisms injected, the surgical defects healed as promptly as those in our control. This series of experiments demonstrates that the presence of organisms found in human gastric

ulcers has no effect either in giving the experimentally produced effects the characteristics of chronic gastric ulcer or in retarding healing. Elliott²⁴ produced ulcers in less than two hours, before there was time for infection. The ulcers resulted from the action of the gastric juice upon the damaged membrane. They do not appear if the stomach is kept empty. Friedman,²⁵ in speaking of gastric ulcers, says: "So far as infections are concerned, we are now on the infectious track, so to speak, and every disease is considered as due to infection; but unquestionably a great percentage of ulcers are due to other causes than infection. I do not believe that the majority are due to infection."

Dowden and Weidner²⁶ state that simple abrasion of the mucous membrane is the starting-point for gastric ulcer with subsequent infection. In 277 cases, 40 per cent. followed infectious diseases. More than 65 per cent. had constipation, with diarrhea in but 1 per cent. One case was a hookworm patient. The ulcer disappeared after thymol treatment. Friedman and Hamberger¹⁹ believe that there are a variety of causes—first and foremost, infections elsewhere in the body. Sippy²⁷ reports that at time of operations 66 $\frac{3}{6}$ per cent. had a previous history of appendicitis or cholecystitis. Bolton produced ulcer by injecting an emulsion of the scrapings of gastric ulcer, increased by the injection of hydrochloric acid. Constriction of the pylorus causes food to remain in the stomach longer than it should, and prolonged secretion of the gastric juice with hyper- or hypo-acidity.

It would be out of the question to find any experienced specialist upon either arthritis or gastric ulcer (and these are typical of the other diseases attributed to the teeth by this theory) who would be willing to confine his treatment to the correction of dental defects. Enough has been said to show that he would not be warranted in so doing upon the strength of the part played by the streptococcus viridans, which in the bulk of opinion receives but meager attention. It certainly is not considered by

the majority as the first cause of these conditions. As far as the teeth are concerned, persons with no teeth have both arthritis and gastric ulcer fully as much as persons with teeth. It might very properly be recommended that missing teeth be supplied for their effect upon digestion and upon nutrition. The importance of this principle is recognized in the army. How many teeth? is the first question. Next, Are they so placed that they can perform the first act in alimentary digestion? The specialist upon gastric ulcer or upon arthritis would undoubtedly recommend that all dental pathological conditions be corrected, but he would consider these only as contributory factors.

If we consider the bacterial invasion not as the primary cause, but as secondary to it, then we have an interpretation of the part played by streptococci of the viridans type that more nearly fits all these various ideas. The streptococcus has at one time or another been held responsible for many diseases, as smallpox, scarlet fever, whooping-cough, only to become known as a secondary invader. Streptococcus infection is secondary in tuberculosis.²⁸ It is secondary in poliomyelitis.²⁹ It is secondary in the tissues of the diabetic, of the alcoholic, in experimental scurvy. It is secondary to tissue alteration produced by previous diseases, by trauma, by chemical irritation, by circulatory disturbances, by various metabolic disturbances, by nervous conditions. "They [non-hemolytic streptococci] depend for their parasitic growth on the *previous preparation of a focus of lowered resistance*, even in subacute bacterial endocarditis; when this type of streptococcus is found constantly in the blood stream the growth of this variety of streptococci on a previously injured heart-valve seems purely saprophytic."³⁰ It is secondary in pyorrhea. It is secondary in dental abscesses. In reasonable doses streptococcus viridans will not grow in healthy tissue. Injected into the gums only, spontaneous healing occurs. Pyorrhea has not been produced by the injection of any organism or group of organisms. The infection of pyorrhea

is secondary to the trauma of irregular dental articulation or to the tissue alteration of an anomalous metabolic condition, or to various other things. A tooth struck a blow dies; the pulp contains a streptococcus infection. The infection is secondary to the blow; there has been no external communication.

A dental abscess cannot be established by streptococcus injection about a sound tooth. It is only about a pulpless tooth with disturbed circulation and an over-worked peridontium that the infection will take place; the infection is secondary. The advocates of this theory state that all these various general pathological conditions arise from a primary focus of infection, but they do not explain why and how the bacteria become parasitic in the original focus. Micro-organisms do not wander indiscriminately throughout the body and localize without any reason whatever. The idea that we have just stated offers a reasonable explanation for both how and why the micro-organisms become parasitic in the primary focus, and for their localization, namely, that they are secondary to tissue alteration.

Rosenow³⁰ has evolved his theory of elective localization as having a bearing upon this question. Dr. Rosenow shows that if streptococci cultured from a gastric ulcer are injected in large doses into animals, in a good percentage of cases lesions appear which he regards as the initial process in gastric ulcer formation. If he injects streptococci from other sources he produces certain effects which he regards as evidence of the tendency of the micro-organisms to localize in the same region from which they were taken. It does seem as if micro-organisms that have been living in a certain tissue might acquire properties that adapt them for growth in that specific tissue. The stronger the tendency to localization the better from a dental point of view, for then the micro-organisms from a blind abscess will produce only a blind abscess and not gastric ulcer or anything else.

In the *National Dental Journal* Dr. Rosenow³¹ cites the case of a patient

seriously ill with appendicitis. Cultures taken from the appendix, tonsils, and a loose third molar all had the property of tending to localize in the appendix of a susceptible animal. The localizing property is acquired from the tissue in which the micro-organisms have grown, and we must conclude, not that the loose third molar caused the appendicitis, but that whatever elective property these micro-organisms possessed proceeded from the appendix. In a patient so saturated with the toxins from appendix disease that he was gravely ill we should naturally expect any bacterial growth that was in evidence in certain weak spots to absorb some of these toxins. That is, the third molar did not cause the illness, but the flora about it was affected by the illness. It is not logical to speak of bacterial localization and bacterial diffusion in the same breath.

"Points of entrance" and "foci of infection" are other terms in constant use in connection with this theory. The use of the term "point of entrance" gives the impression that the internal organs are protected from bacterial invasion by an impenetrable integument which when punctured affords an entrance into bacteria-free regions. This by no means represents a complete picture of the manner in which infection takes place. Nor does the forcing into a rabbit's ear-vein of a quantity of micro-organisms represent what actually takes place in acquiring an infectious disease. It is a laboratory experiment of great value in our studies, but it only simulates what actually takes place in the body. No one ever pays any attention to the point of entrance in whooping-cough, scarlet fever, measles, mumps, typhoid fever, diphtheria, small pox, or any other communicable disease. Teeth are extracted wholesale and the wounded tissue exposed to the bacteria of the mouth, and nothing ever happens but rapid healing. The dog licks his wounds, and no more normal healing could possibly occur. We are dealing with normal alimentary flora. We eat, drink, and breathe bacteria. There is no such thing as a sterile mouth, nor has nature

intended that there should be. The human organism has an elaborate and efficient protective system, and under normal conditions it is perfectly well able to attend to the type of flora under consideration.

A "focus of infection" is a localized pathological area in which bacteria are to be found. Here goes on the conflict between the bacteria, their morbid products, and the host. Here the process is centralized, and if the forces of immunity are unimpaired the bacteria, if not actually destroyed, are walled off from the rest of the human system; and more, the individual attains a high and a specific immunity against this specific morbid process. Bacteria are not discharged freely into the circulation to wander about at will and to settle without rhyme or reason at any point they may choose. Once they enter the blood they are shortly disposed of by all the forces of immunity. Should they be introduced into the circulation not in small numbers, but in large numbers and in increasing doses, what happens? A high degree of immunity is obtained. This is the very method employed to obtain immune sera. The exponents of the focus theory ignore this. Is all the work upon immunology to be here thrown aside?

The principle of the bacterial distribution from a focus is to be likened to the exposure of the vaccinated person to smallpox, to the person inoculated against typhoid to typhoid, to the person inoculated against tetanus to tetanus infection, and so on. These persons are immune to the specific flora. Persons are to a great degree immune to their individual alimentary flora. What is there about a so-called granuloma that indicates bacterial diffusion? It is a walled-off, circumscribed area, a thickened sac of fibrous tissue. It may contain a few non-virulent streptococci, but so does the healthy mouth. Its histology shows that it undergoes fatty degeneration, and it frequently calcifies. It is a minor and harmless thing.

The studies upon streptococci^{32 33} indicate that there is a great diversity of

opinion as to their classification. Much remains to be cleared up in this field.

The bacteriology of pyorrhea needs further study, but the most important micro-organisms so far found seem to be the anaerobic spirochetes and the fusiform bacilli. In our laboratory, an injection of a massive dose of the material from some very pronounced cases of pyorrhea did not affect mice. Injections intraperitoneally of 5 cc. cultures in blood broth of the material from pyorrhea pockets had no effect upon mice; spontaneous healing occurred.

The organisms of caries, according to Miller, are lactic acid producers. Our own studies show the constant flora to be that of the Moro-Tissier group. They are high acid-formers and non-virulent.

The protozoa of the mouth are harmless scavengers, and are present very constantly. The flora of the ordinary pathological dental areas are therefore low in virulence, and it is difficult to conceive that they have much to do with general diseases. The topic of the mouth flora in carriers remains to be studied, but it is fair to assume that the character of oral flora is more or less defensive against pathogenic organisms.

It has been stated by some of our leading men that the teeth were responsible for the pneumonia in the army and navy. The part played by the pneumococci of the mouth in lobar pneumonia is a fair representation of the part played by common mouth organisms in other general diseases. This has been studied at the Rockefeller Institute, by Avery, Chickering, Cole, and Dochez,³⁴ and is particularly instructive. They studied the types and incidence of pneumococci found in healthy mouths, and of the types that accompany acute lobar pneumonia. As a result of the study they state that

The pneumococci most commonly found in the mouth give rise to the minority of the cases of lobar pneumonia. . . . The disease produced is less severe for man. . . . Types I and II, the cause of the majority of cases, are seldom or never found in the mouth secretions of normal individuals. . . . This seems to indicate that lobar pneumonia due

to types I and II does not arise from infection with a pneumococcus which is habitually found in the mouth, but that infection with these organisms occurs from without. If all cases of lobar pneumonia were due to an infection of the individual with a type of pneumococcus which was more or less constantly present in his mouth secretions, one would expect this organism to persist or at least reappear in the sputum after recovery from the disease had occurred A study . . . reveals the fact that only in exceptional instances does one find in the sputum for a considerable time after recovery the same type of pneumococcus with which the individual was infected during the disease. . . . These observations indicate that the type of pneumococcus responsible for lobar pneumonia in any individual is but a temporary and accidental inhabitant of his respiratory passages, and therefore give additional evidence that the infection occurs from without.

From what has been said it is evident that this theory is a most limited one. It ignores established principles in the conflict between health and disease. It magnifies its own viewpoint and disregards all others. The mouth does not preside over disease, but it is subject to it. The mouth of the diabetic, of the alcoholic, of the syphilitic, of phosphorus poisoning, the loosened teeth of the guinea-pigs as the result of systemic conditions, are not conditions brought about by a tooth focus or any other focus of infection. The infection is secondary.

We must explain the beneficial results that follow dental remedial measures upon other grounds. The occasional effect that follows the removal of an impacted third molar is often spectacular—but this is not an infective thing; it is a profound nervous and vascular disturbance of mechanical origin. Clean up any infected or diseased area, of course. Place the mouth in a serviceable and hygienic condition, and keep it so, but do not impress the patient with the fact that by so doing you are eliminating all disease. You are not.

X-ray findings are to be interpreted with great judgment and caution as indicators of disease about the teeth. You

cannot substitute X-ray findings for actual bacterial examinations. You cannot tell infection by the X-ray; you cannot tell pus by it. The X-ray is a valuable thing, but it cannot be relied upon exclusively. Clinical symptoms should first be regarded; actual cultural examinations should follow. Many a piece of dental work done solely upon the strength of X-ray findings has meant the eradication of a protective process already established by nature. The substitution of another with excessive and additional tissue loss is not good practice.

Dentistry has not fallen down. It has on the whole done a most useful and serviceable work. It has known the value of the teeth to the individual, and has made every effort to save them and to restore their loss. The teeth have not caused disease, but have warded it off. Dentistry has recognized the value of nutrition in health and in disease, and has done its part to aid it. The teeth are placed in the mouth as first aids in the process of digestion. Their loss throws an additional burden upon the rest of the alimentary apparatus, which frequently is little able to stand the strain.

The ideas that we have given constitute a protest against the indiscriminate extracting of teeth for their effect upon general diseases about which no one as yet knows much.

BIBLIOGRAPHY.

1. FABER. *Journ. Expt. Med.*
2. ROTHSCHILD and THALHEIMER. *Journ. Expt. Medicine*, xix, No. 5.
3. ROSENOW. *Journ. Inf. Diseases*, 1914.
4. NATHAN. *Journ. Med. Research*, xxxvi, No. 2.
5. OXHAUSEN. *Archiv f. klinische Chirurgie*, civ, No. 3.
6. SEVER. *Bost. Med. and Surg. Journal*, clxxiii, No. 2.
7. WOLLENBERG. "Aetiologie der Arthritis deformans," Stuttgart, 1910.
8. HAMMOND. *Journ. A. M. A.*, lxx, No. 13.
9. SMITH. *Journ. A. M. A.*, lxx, No. 9.
10. PEMBERTON. *Am. Journ. Med. Sciences*, cli, No. 3.

11. McCOLLUM and PITZ. *Journ. Biol. Chemistry*, 1917, xxxi, 229.
12. PITZ. *Journ. Biol. Chemistry*, 1918, xxxiii, 471.
13. JACKSON and MOORE. *Journ. Inf. Diseases*, 1916, xix, 478.
14. STEINHARTER. *Bost. Med. and Surg. Journal*, clxxiv, No. 19.
15. MANN. *Journ. Expt. Medicine*, xxiii, No. 2.
16. HARDT. *Am. Journ. Physiology*, xl, No. 2.
17. ELLIOT and HENRY. *Brit. Med. Journal*, i, No. 2884.
18. DURANTE. *Surg., Gyn., and Obstetrics*, xxii, No. 4.
19. FRIEDMAN and HAMBURGER. *Ill. Med. Journal*, xxvi, No. 3.
20. ROSENOW. *Journ. A. M. A.*, lxiv, No. 18.
21. BERTRAM. *Journ. A. M. A.*, lxiv, No. 20.
22. BURGE and BURGE. *Journ. A. M. A.*, lxvi, No. 14.
23. WILENSKY and GEIST. *Journ. A. M. A.*, lxvi, No. 18.
24. ELLIOTT. *Quart. Journ. Medicine*, January 1914.
25. FRIEDMAN and HAMBURGER. *Journ. A. M. A.*, lxiii, No. 5.
26. DOWDEN and WEIDNER. *Lancet-Clinic*, cxiii, No. 12.
27. SIPPY. *Journ. A. M. A.*, lxiv, No. 20.
28. HALL and HARVEY. *Journ. Med. Research*, 1917, xxxv, No. 3.
29. SMILLIE. *Journ. Expt. Medicine*, 1918, xxvii, 319.
30. BULL. *Journ. Expt. Medicine*, 1917, xxv, 557.
31. ROSENOW. *Nat. Dental Journal*, November 1917.
32. KINSELLA and SWIFT. *Journ. Expt. Medicine*, 1917, xxv, 877.
33. HOWELL. *Journ. Inf. Diseases*, 1918, xxii, No. 3.
34. AVERY, CHICKERING, COLE, and DOCHEZ. Rockefeller Inst. Med. Research. Monograph No. 7.
35. KINSELLA. *Journ. Expt. Medicine*, 1918, xxviii, No. 2.

10 EXETER ST.

Root Resection.

By EMERSON R. SAUSSER, D.D.S., Philadelphia, Pa.

(Read before the annual meeting of the Maryland State Dental Association, held at Baltimore, June 5-7, 1918.)

THE etiologic importance of chronic periapical infections is a recognized fact. The interrelation between these infectious areas and the other parts of the body as foci of infection is no longer a theory, but actual knowledge established by great masses of clinical evidence and reports from research laboratories. Dentistry is now recognized as an indispensable specialty of medicine, and with the rapid scientific strides it is making, this recognition will be amply justified. The issue is squarely put before dentists to rid the mouth of septic foci. We are confronted with the subject of chronic periapical infections, their prevention and eradication, as real factors of modern medicine. Therefore it is our duty to locate and remove these infectious areas along with the other septic foci of the mouth.

The first step in searching for periapical infections, which have been aptly termed by Thoma intra-osseous infections, in contradistinction to those of the soft tissues, which he terms extra-osseous, is to apply a thorough systematized technique of diagnosis which requires a sound understanding of dental anatomy, histology, pathology, and bacteriology. The diagnostic sense, invaluable to us and usually acquired by experience, is in jeopardy because many men, especially recent graduates, are prone to depend *exclusively* on the roentgenogram for diagnosis, whereas an intelligent interpretation of a roentgenogram is only possible after a thorough clinical examination is made. The clinical data is obtained from a history of the case and an exploratory and visual examination

of the parts, permitting of a tentative diagnosis, which will be corroborated, disproved, or augmented by a careful reading of the roentgenogram.

ACUTE APICAL ABSCESS.

Diagnosis. The diagnosis of an acute apical abscess is usually easily made from the classical clinical picture of acute suppuration. The invading organism, which is usually of the streptococcus group, hemolytic type, and of high virulence, makes a rapid, vicious attack on the periapical tissues, causing pain, tenderness, and swelling to a degree which accords with the virulence of the organism and the resistance of the body. On the roentgenogram the destruction of the surrounding bone and tissues may in a very few cases be seen. Sometimes it is quite distinct, with an irregular and indefinite outline, and again, it may look like a faint veil, possibly due to the infiltration of the cancellous part of the bone with pus. When absent on the film, it is usually hidden in front or behind the root, or the pus may have easily and quickly escaped through the bone by a small opening to the soft tissue, or along the inside of the root, or via the root-canal, leaving no appreciable destruction of bone, because of the drainage. In some cases bone destruction is seen twenty-four hours after suppuration starts, so virulent is the organism.

Treatment. If an acute apical abscess is intelligently drained, a thorough canal preparation accomplished, and all parts treated with Dakin's solution (dichloramin-T) for five or six consecutive days,

the condition of disease should clear up readily.

CHRONIC APICAL ABSCESS.

Diagnosis. The diagnosis of a chronic apical abscess is oftentimes difficult,

the presence of *macroscopic pus along with extensive tissue destruction*. The writer has seen cases where a vicious infection of the body existed through chronic periapical infection without any appreciable evidence of bone destruction shown on the roentgenogram. The in-

FIG. 1.



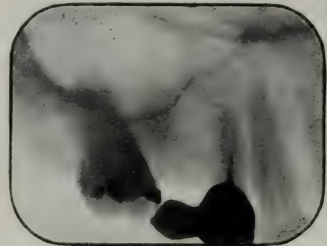
A. Extensive destruction of bone around lateral and central teeth due to a chronic abscess. B, Preparatory to resection. C, Months after resection.

especially in the absence of a definite history and of the objective and subjective symptoms. The history of previous subacute attacks, the evidence of old fistulous scars, tenderness of the glands or lymph nodules on the neck to digital pressure, tenderness of the tooth to decided percussion, and the presence of general systemic involvement, are aids to the diagnosis. A valuable and simple test to ascertain the presence and extent of bone destruction of the alveolar plate was suggested by Crane,* in which, with a small hard pledget of cotton held with the cotton pliers and pressed on the overlying soft tissues at the suspected region, a pitting occurs as in edema.

A chronic condition of apical abscess can exist for many years, all the time causing slow disintegration of bone tissue, and this cavity acting as the reservoir for a purulent exudate, without any external manifestation whatever. (Fig. 1.) Unfortunately, a great many dentists associate infection only with

sidious and subtle *infecting powers* that these organisms acquire in the periapical tissue constitute the dangerous feature, and not the presence of extensive bone lesions, often erroneously used as an in-

FIG. 2.



Small suppurating granuloma. A condition of articular arthritis cleared up with the extraction of tooth and curetment of area.

dex in determining the presence of infection. (Fig. 2.)

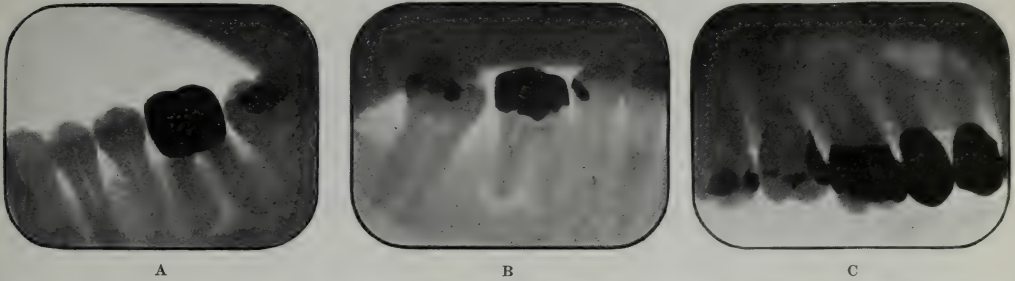
On the roentgenogram the area of tissue destruction, when demonstrable, will usually appear more regular and definite

* DENTAL COSMOS, vol. lix, No. 8.

in outline than it does in the case of an acute abscess, the invading organism being of lower virulence than that found

tially destroyed and with a roughened condition of the root-end should be treated surgically.

FIG. 3.



A, Exostosis of mandibular molar roots of left side caused by a chronic suppurating granuloma. Patient died of pernicious anemia a few months after roots were extirpated. B, Similar condition of molar on right side of same mouth. C, Pathological bone-cavity over first and second upper left bicuspids in same mouth contained a gangrenous mass.

in the acute abscess. There is usually evidence of destruction of the root-end and its membrane, and there often occurs a hypercementosis of a good part of the root-end. (Fig. 3.) When there has been early and frequent escape of the pus, no appreciable bone destruction can be shown with the roentgenograph; espe-

GRANULOMATA AND CYSTS.

Diagnosis. In the early stages of chronic inflammation of the periodontal membranes, nature, by exerting a wonderful resistance against an organism of low virulence, will temporarily, or permanently, organize the tissues against in-

FIG. 4.



A, Granuloma on lower central. B, Immediately after resection. C, Two years after resection.

cially is this true in cases of diseased central or lateral incisors when the fistulous opening in the bone is located in front of the root.

Treatment. A chronic periapical infection with periodontal membrane par-

fection with a formation which has been called the dental granuloma. (Fig. 4.) Henrici and Hartzell* define grossly the

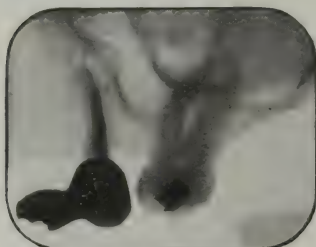
* *Journal National Dental Association*, vol. iv, No. 10.

dental granuloma as consisting of "a fibrous capsule continuous with the periodontal membrane, containing a mass of very soft grayish tissue, and at times fluid or semi-fluid yellow caseous tissue, or small specks of solid cheesy substance." As degenerative processes within this mass occur, due to reinfection, lowered resistance, trauma, etc., its identity is changed; necrosis and suppuration follow, causing a purulent condition to exist, with or without symptoms of acute inflammation. On the roentgenogram the cavity in the bone containing this formation usually appears fairly dark, with a somewhat regular and definite

These inflammatory masses have *capillaries running through the fibrous capsule into the bone*, giving a *direct passage* for infecting agents into the system via the lymph channels and the blood stream. The periodontal membrane and cementum are virtually fighting for their existence under these conditions. With this evidence, the contents of any pathological bone cavity in the periapical region of the tooth should *always* be considered *infectious* and *promptly* eradicated.

The diagnosis of infectious periapical disease having been made, the co-operation of the physician, especially where the physical expression of the patient

FIG. 5.



Well-defined cyst formation about upper second bicuspid. Resection unfavorable.

outline, unless reinfection has occurred, causing irregular inroads of destruction at some part or parts of the surrounding bone.

A dental cystic formation may sometimes follow the granuloma through the breaking down of the center of the mass by a degenerative process until the walls become a thin fibrous sac, epithelial in character. On the roentgenogram the cyst is easily seen when near the surface by its regular balloon-like appearance, varying in size from that of a pea to that of a plum, and at times very dark. (Figs. 5 and 6.) According to the investigations of Thoma, Grieves, Prinz, Henrici and Hartzell, and others, all these formations of new inflammatory tissues, being of an infectious origin, are subject to retrograde changes at almost any time, with a recurring infection and the formation of an abscessed condition.

FIG. 6.



Large cyst formation causing extensive rarefaction osteitis of palatal region.

and the early history indicate metastatic disturbances, is absolutely necessary, so that the combined reports will determine the best course of treatment and the patient receive the maximum benefit from the consultation. More familiarity with dental pathology on the physician's part, and of general pathology on the dentist's part, would prove wonderful aids in this specialty.

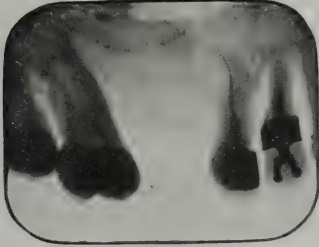
The present status of dental therapeutics is such as to make surgery the rational procedure in eliminating those chronic apical infectious areas where there is evidence of destruction of the periodontal membrane and cementum during the course of infection, especially so where the complete and rapid eradication is indicated, as in systemic infection, or where the patient should re-

ceive the benefit of the doubt, both as a preventive and curative measure. (Fig. 2.) The reports of results in medicinal treatment in these conditions, showing

a window of bone, and replacing the flap of gum and periosteum in position.

Root resection is indicated in the following conditions:

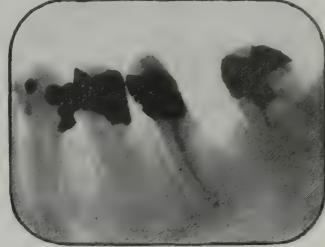
FIG. 7.



Abscess condition of second bicuspid, draining into antrum. First bicuspid with periodontal membrane and bone destroyed, draining into the mouth. Second molar containing pulp nodule. Patient suffering with antral empyema, also a gastric disorder and neuralgia.

the elimination of diseased tissues, with bone regeneration, are too meager to be dependable. Fortunately, necessity has revived the subject of root resection with improved technique along scientific lines, with most gratifying results.

FIG. 8.



Diseased distal root of lower first molar removed with retention of anterior root showing multiple foramina.

(1) All cases of chronic abscess where there has been destruction of root tissue.

(2) The different dental granulomata and dental cysts.

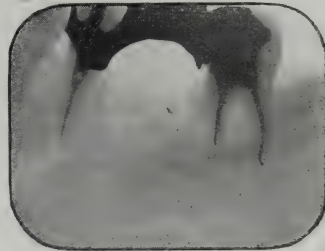
(3) The exostoses occurring in pulpless teeth in the presence of infection.

(4) Also where the presence of an instrument in the canal, or malformed roots, make complete canal technique impossible.

FIG. 9.



A



B

▲, Rarefying osteitis with extensive bone destruction caused by a suppurating granuloma on lower right first molar, involving the second bicuspid and second molar. First molar extracted and bicuspid and second molar drained through socket of first molar following extraction, and stabilized with bridge. B, Remarkable bone regeneration after two years.

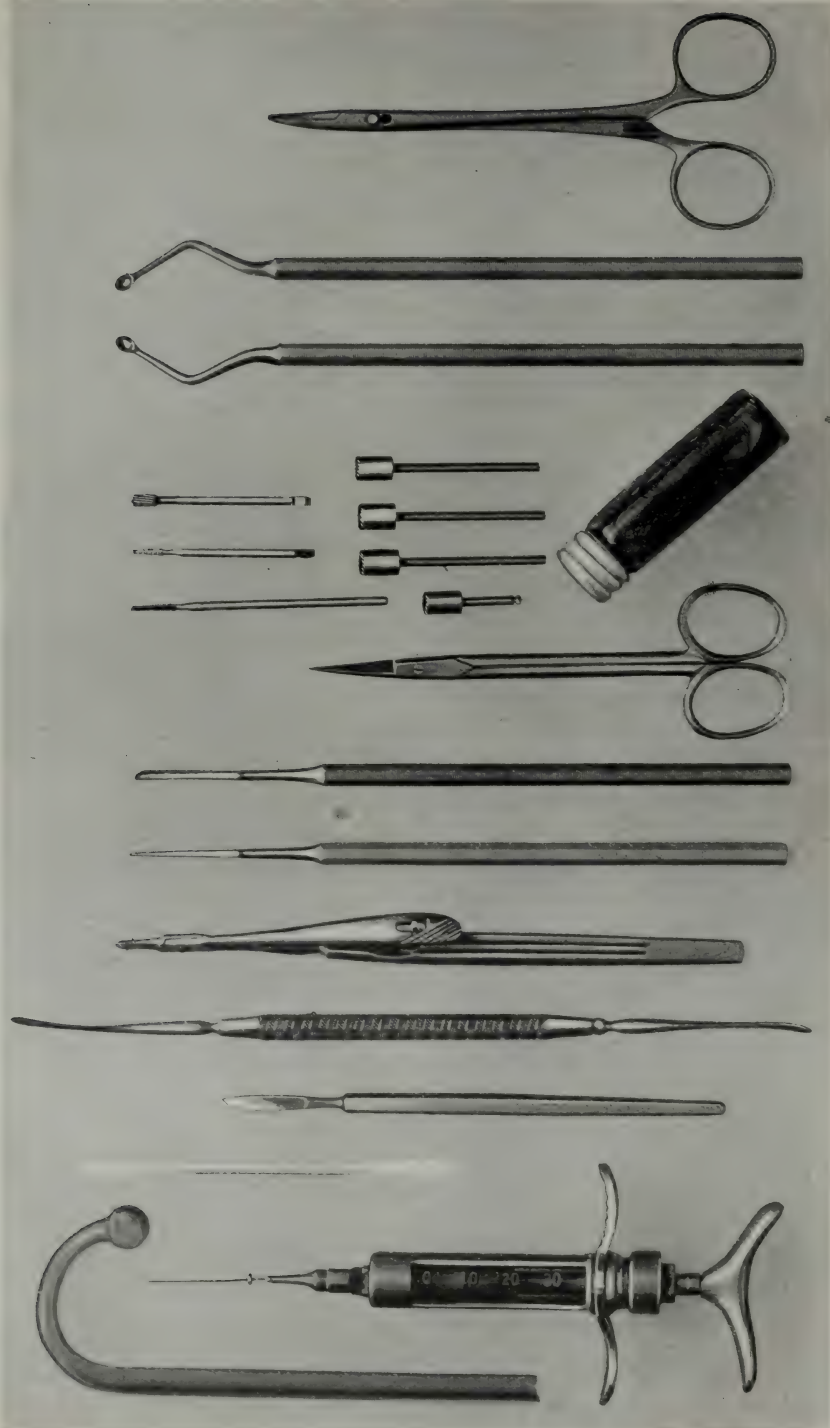
INDICATIONS FOR ROOT RESECTION.

Root resection may be defined as the excision of the diseased part of the root-end, and curettment of the involved periapical tissue, after laying back a flap of the gum tissue and periosteum, removing

(5) In deep fractures and perforation.

(6) Where there is evidence, or a definite suspicion, of infection with systemic involvement which is not amenable to medicinal treatment.

FIG. 10.



Part of instrumentarium employed in root resections.

CONTRA-INDICATIONS FOR ROOT RESECTION.

Root resection is contra-indicated in the following conditions:

(1) Inaccessibility, and thick bone conditions.

(2) Where the retention of the tooth would be jeopardized by a too extensive

FIG. 11.



Showing method of retracting gum flap with ligature attached to Killain head-band.

removal of the diseased portion of the root.

(3) Where the proximity of the tooth to a diseased sinus indicates its removal. (Figs. 5 and 7.)

(4) Teeth the retention of which is impaired by a diseased condition of the sustaining membrane, as in pyorrhea.

(5) Where the general condition of the patient becomes a factor. (Fig. 3, c.)

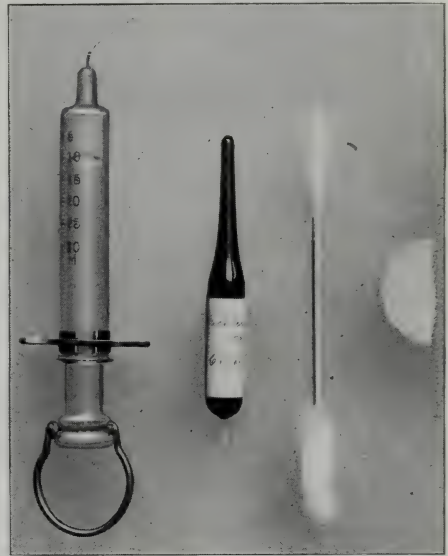
The teeth, arranged according to their suitability and accessibility, are as follows: (1) Upper and lower incisors. (2) Upper cuspids. (3) Upper second

bicuspid. (4) Upper first bicuspid. (5) Upper first molars (buccal roots). (6) Lower cuspids. (7) Lower first and second bicuspid. (8) Upper first and second molars (lingual roots).

In lower molars it is good practice to divide the tooth vertically and extract the infected root *in toto*, when possible. (Fig. 8.)

Root resection, although comparatively a simple operation, requires skill and

FIG. 12.



Irrigating syringe; ampule 5% dichloramin-T.

judgment, as do other procedures in dentistry, but especially does it demand the *strict observance* of all the modern principles of aseptic surgery, which will insure quick healing and successful results.

INSTRUMENTARIUM.

The instruments and materials used in the root resection operation follow, in the order of their use, some of which are shown in Figs. 10, 11, and 12.

Tray for unused instruments, containing 65 per cent. alcohol.

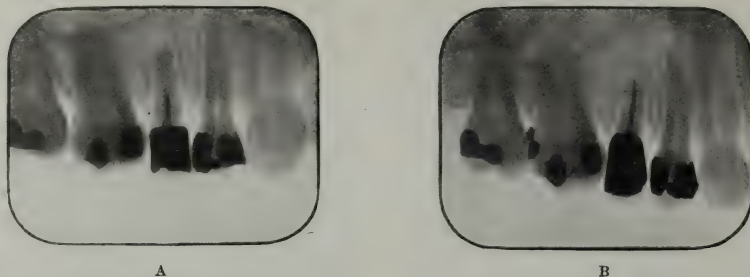
Tray for used instruments, containing 65 per cent. alcohol.

Wooden applicator sticks wound with sterilized cotton.

Saline solution (3½ per cent.) of iodine.
 Hypodermic syringe.
 Novocain-adrenalin (2 per cent.) solution and accessories.
 Novocain (20 per cent.) with nasal applicator.
 Saliva ejector.
 Gauze napkins.
 Modified Killain head-band and lip retractors. (Fig. 11.)

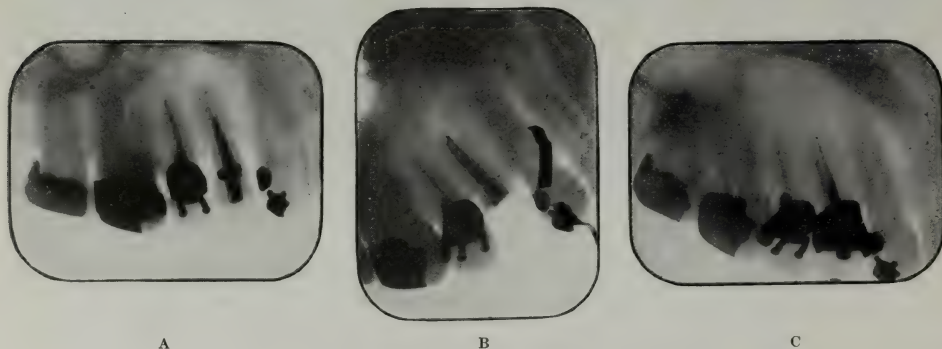
Curets.
 Round bur.
 Finishing bur (flame-shape).
 Horsehair suture.
 Dakin solution (5 per cent.). (Fig. 12.)
 Dakin solution syringe.
 Curved scissors.
 Plain gauze.
 Adhesive tape.
 Bone-varnish.

FIG. 13.



A, Chronic rarefying osteitis before sterilization of root-canal, refilling, and resection.
 B, Same case four years after.

FIG. 14.



A, Chronic rarefying osteitis with suppuration on upper first bicuspid. B, Same after canals were treated, filled, and resection performed. C, Same three years after, showing encapsulation of root-end with regenerated bone.

Small scalpel.
 No. 6 full curved (patent eye) eye needles.
 Sterilized floss silk.
 Periosteum stripper.
 Straight and curved hemostats.
 Clean engine handpiece.
 Small cross-cut fissure burs (slight taper).
 Bone-chisel.
 Saline solution wall irrigator.
 Exploring instrument.

All canals are to be cleaned and filled to as near the end as possible, recognizing all the principles embraced in the teachings of Callahan, Crane, Best, and others. Success in root resection depends so much upon the condition of the canal and a well-condensed canal filling, that where there is the *slightest doubt* in these particulars one should unhesitat-

ingly *re-sterilize* and *refill the canal*, even though the tooth is carrying a crown. (Figs. 13 and 14.) In the majority of cases this is to be done preferably *before* the resection operation than after—its main feature being that it permits a more thorough condensation of the root-canal filling, and disposes of this procedure, which otherwise would have to be effected during the operation of actual root resection, causing undue annoyance to the operator and the patient. If the root is to be crowned, the crown should be cemented to place before the resection operation, with due observance as to the bite. One should also correct malocclu-

into the infraorbital and incisive foramina, gives excellent results where deep curetment is to be done.

TECHNIQUE OF THE OPERATION.

A $3\frac{1}{2}$ per cent. saline solution of iodine is applied to the mucous membrane at the points of injection and around the field of operation, after previously drying the same. The head-band is adjusted and lips retracted. The saliva ejector is used and gauze pads placed about the teeth. After again observing on the roentgenogram the general direction and shape of the root, and its rela-

FIG. 15.



A, Root resected completely. B, Immediately following removal of tip. C, One year afterward.

sion when it exists, as the tooth must have surgical rest after the operation. The mouth should be thoroughly cleaned, and the appointment for the resection set for the early morning. All details as to arrangement of instruments and asepsis should be attended to well before the time of the appointment.

ANESTHESIA.

Either infiltration or conduction anesthesia is used as indicated—usually the combination of both. The anesthetic used is 2 per cent. novocain-adrenalin solution. For the upper anterior teeth the application of 20 per cent. novocain in distilled water in the nostrils, applied with a good-sized nasal tampon, as suggested by Prinz, to paralyze the nerve filaments not reached by the injections

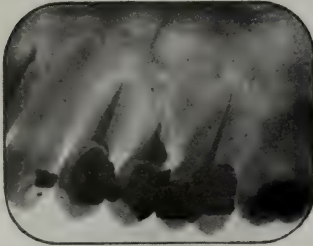
tion to the adjacent roots or an adjacent sinus, a *slightly* semilunar incision is made at the point where the apex of the root is estimated to be, the curve of the incision extending toward the gingiva, never nearer than *one-eighth of an inch* from this structure, and extending as far as the apices of the approximating teeth.

The incision is made deliberately and deeply, to include the periosteum. The periosteum stripper is now used to roll back the flap, including the periosteum, care being taken not to strip the tissue *too high*, as this causes traumatic post-operative pain and soreness. Instead of a hand or mechanical retractor, the writer passes a long piece of horse-hair, or fine floss silk ligature, through the flap, well up toward its attachment, and attaches the ligature to one of the

lugs of the head-gear, completely retracting the parts. (Fig. 11.) This method prevents mutilation of the periosteum and soft tissues of the flap, which *always* occurs when grasped with unsteady

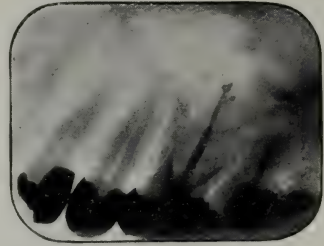
cavity is now in view, and the root-end and its surrounding involved tissue is carefully studied to determine the extent of the pathological condition. The parts are irrigated with saline solution, and

FIG. 16.



Resection of lateral, first and second bicuspids, and lingual root of first molar.

FIG. 17.

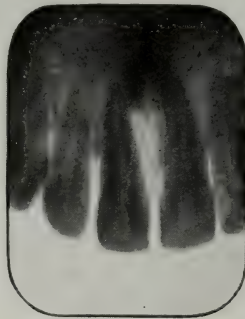


Resection of lingual root of second molar.

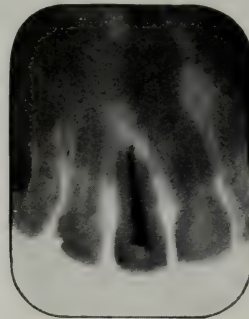
sharp-pronged retractors. It also relieves the assistant of holding the flap, permitting attention to other duties. On the *lingual* roots of the *upper molars* the curvature of the incision is pointed to-

ward the diseased portion of the root is *completely, not partially*, severed with an unused fine tapering cross-cut fissure bur, used in a *clean* handpiece run at *medium* speed. The severed end is dissected out with spoon-shaped excavators,

FIG. 18.



A



B

A, Extensive destruction of bone with fistula mesial to affected upper left central due to a chronic pericemental abscess of two years' standing. B, Eight months after nerve was extirpated and resection performed.

ward the apex of the root, and the flap retracted with the ligature tied around the crown of the tooth.

The bone window is now made with a *sharp* bone gouge, *sharp* chisel, *unused* bur or trephine, or in combination, the extent of bone destruction determining the size of the window. The bone

along with any formation that may be attached to it. Sometimes it is necessary to dislodge the root-tip with an elevator, as in exostosed conditions. The use of a chisel to sever the root-end is *unnecessarily* abusive to the patient and to the delicate periodontal membrane and the buccal supporting plate of bone. The

bone cavity is again irrigated and dried, is carefully observed, and its walls completely cleaned of pathological tissue, either by curet or bur, until all diseased bone is removed and its surface presents a healthy condition. The sharp edges of the root stump are now smoothed, as are also the margins of the window. The walls are dried with cotton balls and flooded with Dakin solution (dichloramin-T); bleeding is encouraged, and, in the great majority of cases, the wound is now closed by suturing the flap, with one or two stitches of No. 00 chromic catgut or horsehair, being sure to take in enough tissue to prevent tearing out of the suture, and being careful not to draw the suture too tightly.

POST-OPERATIVE TREATMENT.

The external parts are now dried, and two thicknesses of sterile gauze, just large enough to overlap the edges of the wound, are placed in position and varnished, and held in position with bone-varnish. Some mouths are favorable for placing over the gauze a suitable sized piece of surgical adhesive tape cut kidney-shape, which can be made to adhere to the mucous membrane and labial surfaces of several of the adjacent teeth. Such an adhesive plaster will be surprisingly well retained in position in some mouths, forming a support for retaining the gauze in position. A thorough flooding of the bone cavity and a saturation of the gauze covering the lips of the wound may be effected by passing the blunt end of the Dakin syringe needle (Fig. 12) between the lips of the wound at a convenient opening previ-

ously made in the adhesive tape. This technique permits of an almost constant germicidal action from the germicidal preparation, eliminating any infection that the operation has failed to remove and preventing reinfection from the mouth. The plaster and gauze should be removed daily, for from two to five days, and the same procedure followed, with due observance to asepsis as the case indicates; then it can be safely discontinued and the stitches removed. Too much stress cannot be laid upon the warning to let these wounds alone as much as possible, as they heal more readily if the healing process of nature is not *unduly interfered* with by overpacking the wound with gauze, etc.

If suppuration should continue, the wound should be reopened, again curetted, and treated with dichloramin-T. A curetment of the bone cavity is also indicated where the roentgenogram shows the absence of bone regeneration after one year. The patient is instructed, in the event of post-operative pain, to apply heat or cold to the parts, and to take calomel followed by a cathartic. It is sometimes necessary on the second day to relieve the wound of pressure caused by slight secondary hemorrhage, which produces pain and soreness. The operation is eminently successful, if the principles of surgical asepsis are observed and the parts relieved of infectious and disease conditions.

After from eight to fourteen months a roentgenographic examination should show the former pathological cavity filled with regenerated bone encapsulating the root-end.

S. E. COR. 15TH AND LOCUST STS.

Report on Dental Science and Literature.

By GEO. B. CLEMENT, D.D.S., Meridian, Miss.,

CHAIRMAN OF THE SECTION.

(Read before the Mississippi Dental Association, Meridian, April 16-17, 1918.)

MR. PRESIDENT, FELLOW MEMBERS OF THE
MISSISSIPPI DENTAL ASSOCIATION, LADIES
AND GENTLEMEN:

YOUR committee on Science and Literature begs leave to make the following report, and trusts that it will form the basis for a full and free discussion. The question, Is dentistry a science?—once so frequently propounded, and as often repudiated—is no longer an interrogatory among intelligent and thinking people. The pronounced activities of the dental profession individually and collectively in the past few years have forever settled this question as a positive fact in our favor.

Dentistry in the United States, which has always led the world, has made three big advances in the past two years, deserving attention and commendation. It has organized and put into successful operation the largest Dental Association in the world, the membership of which at the next meeting in Chicago will reach almost thirty thousand.

It has established a National Dental Journal, edited and owned by the profession, free and untrammelled by trade, and published once a month, brim-full of dental scientific literature, for the small cost to each member of two dollars a year.

It has founded, and partly endowed, an Institute of Scientific Research which is today, with the assistance of the profession, solving the many perplexing problems pertaining to dentistry which otherwise might remain a mystery for a long time to come. This great institute

belongs to you and me and is at our service.

Of the many phases of dentistry which are today engrossing the professional mind, we have selected only a few for consideration, as it would be impossible to cover all in a single report and have that report within the bounds of reason as to time and subject-matter.

EXODONTIA.

We would call your attention, first, to the present method of extracting teeth as compared with that of a few years ago. This branch of the profession has been placed on a scientific basis. We now have specialists, known as exodontists, who perform such operations for the regular practitioner, and this work is done with all the precautionary measures known to modern surgery. The shape, anatomy, and position of every tooth is known, and each operation for each tooth has been fully outlined, special instruments being designed for all cases, both simple and complicated. Pain has been eliminated, and not at the risk of life as heretofore. Novocain-suprarenin, and the preparation now manufactured by the Parke-Davis Co., known as apothecin, and adrenalin are taking the place of the more dangerous vegetable alkaloid, cocain, with results that are more satisfactory. I would especially call attention to the preparation known as apothecin, which is a synthetic substitute for cocain, as being entirely dependable. It is used in the same manner as novocain, and is purely an American product.

The operation of extraction preparatory to the insertion of partial and full dentures is today frequently followed by surgical removal of the alveolar process, much time, pain, and trouble being saved in producing satisfactory results. Curetting infected sockets has proved to be a most feasible and necessary operation, and prevents the continuation of apical infection which has in many cases been proved to exist for years after the teeth have been extracted, thus acting as a source of local infection with possible constitutional disturbances as a result. Nerve-blocking, or conduction anesthesia, as first suggested by Braun, and later set forth by Fischer, Smith, and Riethmueller, has become an everyday operation with many of the profession, and has done much to facilitate the operation of extraction, with other surgical operations along the tract of the superior maxillary and inferior dental nerves. In fact, it seems that nature has peculiarly provided available and convenient points where these nerves may be reached by the hypodermic needle with little if any danger.

One of the most important and necessary operations in the preservation of the teeth is the process of cleansing the teeth. This operation has never received the attention its importance demands. In the dental literature of today we seldom see an article on this subject. It has never been systematized or classified, and a lack of thoroughness in the operation is the result. It is to be hoped that someone will systematize this most important procedure, and thus put it on a more secure and scientific basis. Too little time is given to the operation, and the fees charged are not commensurate with the benefit derived from the work, when thoroughly done. You will understand the above comments are confined to cleaning the teeth, and not treating the gums.

The operation of capping nerves is where it was ten years ago: nothing new. Once in a while we find an article on the subject, but it usually only sets forth the same old theory of non-conducting materials and stimulating antiseptics. The operation is looked on with little

favor when undertaken in close proximity to the pulp.

ROOT-CANAL TREATMENT AND FILLING.

Root-canal work has received much attention, and the profession as a whole has about settled on one or two materials as being the proper ones to be used in filling the canal. One is chloro-percha, used in conjunction with gutta-percha points; the other is the method set forth by the late lamented Callahan of Cincinnati, and generally known as the rosin solution method. The rosin is dissolved in chloroform, 12 grains of rosin to 3 drams of chloroform, pumped into the canals and followed with gutta-percha points. The treatment previous to filling tends to the use of milder remedies than previously. Electro-therapeutics in the form of ionization is reported as giving good results. An exhaustive article by Dr. Hermann Prinz on ionization is to be found in the April 1917 DENTAL COSMOS. This article covers the subject in all its phases.

At the New York meeting of the National Dental Association in 1917, the Forsyth Dental Clinic Club, under the supervision of Dr. Percy Howe of Boston, demonstrated the Howe method of filling root-canals by a process of precipitating silver not only in the canal, but filling all foramina and even the tubuli of the dentin as well. It was claimed by Dr. Howe that every tooth may have from one to seven apical foramina, and that this method was the only one yet found that would fill not only the canal, but the tubuli and the several foramina, and do it thoroughly. This precipitation of silver is accomplished by the use of two solutions: (a) Nitrate of silver 3 grams, dissolved in 1 cc. of distilled water, to which is added $2\frac{1}{2}$ cc. of strong ammonia. (b) The second solution is a 10 per cent. solution of formalin. The technique of application is as follows: Prepare the cavity and canal as usual. Dry out the canal, and then by the use of cotton wrapped on a smooth broach, pump the silver solution into the canal, repeating this operation

three or four times. Follow with the formalin solution in the same way, and the pure metallic silver is deposited in the canal. This may be followed with either the rosin and gutta-percha points, or with chloro-percha and gutta-percha points.

Just here I may state that the question of extracting pulpless teeth is agitating the professional mind at present, and there seems to be quite a difference of opinion on the subject, some advocating the extraction of all pulpless teeth, others advocating extraction only as a last resort. Dr. M. D. K. Bremner of Chicago seems to think that these radical views are largely brought about by the existence of two classes—one made up of physicians, exodontists, and pyorrhea specialists, and the other of general practitioners. He claims that the first class are largely radical in their views, while the general practitioner favors making every effort to preserve the teeth. He says further that the specialist's practice is made up largely of the worst cases, and also that he is thinking more about cleaning up disease in the mouth than preserving the teeth. The general practitioner, on the contrary, meets with a wider variety of cases, many of which do not appear to be serious, and he is deeply concerned about preserving and restoring an efficient masticatory apparatus for the patient. From the literature on the subject I am of the opinion that Dr. Bremner is correct. From this we are led to believe that many teeth remain in the mouth which should be extracted, and also a number are extracted that should be saved.

GOLD FILLINGS.

At present it seems that the gold filling is being abandoned. It is true that some few of the profession continue to insert gold fillings, but as a rule I am sorry to say that it is my opinion, and from the literature on the subject conclusively proved, that 50 per cent. less gold fillings are being inserted today than there were ten years ago. The old-

fashioned soft gold filling, one of the best, is practically a thing of the past. Gold inlays have taken the place of gold fillings, and I am constrained to believe that in so doing we are losing ground in more ways than one. The gold filling was at one time a work of art, built upon scientific principles. The preparation of the cavity and the introduction of the gold was in a manner "esthetic calisthenics" for the dentist, and had a tendency to raise the standard of his manipulative ability. In discarding the gold filling for the gold inlay, we lose much of this manipulative skill. The gold inlay has resolved itself into a lump of gold to be fastened in the cavity with cement. Will it stay? Yes. Will it preserve the tooth? No. Now we are speaking in generalities. Of course the gold inlay has its place, but every cavity is not the place for the gold inlay.

AMALGAM.

Amalgam as a filling material has been wonderfully improved. The formation of the cavity and the introduction of the material is put upon a scientific basis, and undoubtedly this filling material is capable of saving more teeth today than ever before. Instead of gold crowns we are now in many cases making amalgam restorations, which in many instances are superior in every sense of the word. It has been conclusively proved that with a fairly good tooth, even though decay has destroyed the greater portion of the crown, yet with proper matrix, good amalgam, and skilful manipulation a more satisfactory result may be obtained by an amalgam restoration than by an all-gold crown. In amalgam restoration the gingival margin may be preserved intact, and this alone is sufficient to recommend a serious consideration of the operation before making use of the gold crown, which is always more or less an offense to the gingival integrity. It is with pleasure I refer you to an excellent article on amalgam restoration in the July 1917 issue of the *Journal of the National Dental Association*, by Dr. J.

V. Conzett. This article is written by one of the best gold-workers in the profession, and amalgam where indicated is fully indorsed by him.

CEMENTS.

The cements have also been wonderfully improved, and today we have cements which meet every demand. The latest cement is one called "Silver cement." The makers claim the following merits for it: Silver chlorid gives a comparative germicidal strength of 3200, as compared with 100 for copper oxid. They also claim as necessary for germicidal efficiency 2 per cent. of the silver salt, whereas in copper oxid 100 per cent. is required. They also claim white and light gray as the color, which is set down as zero for discoloration, against copper oxid (black) 100. The property of coagulation which it is claimed to possess limits its action, and thus protects the pulp. It is also said to be distinctly anodyne in action. There are two forms of silver cement, A and B. A has 2 per cent. of silver chlorid added to the zinc cement, and silver cement B has 2 per cent. of silver phosphate added to the zinc cement. The chlorid combination is recommended for general purposes; the phosphate where medicinal purposes are desired in combination.

The use of "synthetic porcelain" has become general as well as universal. Its merit has been fully demonstrated, and for fillings in the anterior teeth where the stress is relieved by enamel, or removed by the combination of pins and inlays to be faced with porcelain, it is esthetic, durable, and preservative in character. It is being used to replace facings, using the celluloid molds to shape and compress the cement. It is also used to form continuous gums for plain teeth in both bridge work and plate work. It is very good to repair gold fillings, and inlays where the enamel breaks away in small quantities. It is claimed that adhesiveness has been added to the many virtues of synthetic porcelain, and that certified enamel has this added good quality.

PYORRHEA ALVEOLARIS.

Riggs' disease seems to be still baffling the ingenuity of the profession, and from the literature on the subject I feel quite safe in saying that the etiology, pathology, therapeutics, and prognosis of this disease are still mysteries. Every day finds a new name, a new cause, a new treatment, and a disputed prognosis. It is, indeed, a rare but rather a refreshing diversion to pick up a journal not afflicted with an article on this most formidable disease. Leaving out the fads and fancies of the specialist in this line of work, which I will not presume to criticize, the fundamental everyday treatment of this disease is the cleaning and polishing of the teeth, the use of mild antiseptic mouthwashes, tooth powders, tooth pastes, teaching the patient how to brush and care for the teeth at home, massage, and systemic elimination. You will note that I say "mild antiseptics," for the reason that all of the proprietary preparations of washes, powders, and pastes on the market have been tested out, and boric acid, prepared chalk, glycerin, and some one of the essential oils have been found to make up the formulae of almost all of them. As these are largely employed by the profession in everyday treatment, I feel safe in emphasizing the word *mild* antiseptics.

There have been improvements in instruments and instrumentation. We have the X-ray to assist us in diagnosis, and this apparatus has proved especially effective in locating local points of infection, such as chronic abscess, granuloma, and halisteresis. Dr. Wm. Crenshaw of Atlanta, Ga., a specialist in this work, claims that the X-ray defines the process of destruction in both the periosteum and the alveolar process, and gives a dark line along the periosteal border indicating the lead of the disease. He has invented several new instruments for passing between the tooth and process to head off the disease, claiming that this area is the direct line of attack. Having witnessed one of his recent clinics, I am fully impressed that his ideas and method of practice are sound and practical.

The Dakin-Carrel solution has been recommended and used in the treatment of Riggs' disease of late. For the formula of this solution and the method used in treating wounds in general I refer you to an article in the June issue of the *Pennsylvania Medical Journal* for 1917. You will also find an excerpt from this article in August 1917 issue of the *DENTAL COSMOS*, at page 839. The one great barrier to the use of this remedy in Riggs' disease is the utter impossibility of constant application—and upon this depends the success of Dakin's solution in the treatment of any and all wounds. Another drawback to its use in dentistry is the fact that the solution should be freshly made every few days.

Ionic medication is also being used in the treatment of pyorrhea, and the reports speak very favorably of it. The principal and best-known ions used therapeutically are those of the antiseptic group produced from zinc, copper, mercury, silver, iodine, and chlorine. The advantage of this method of therapy over the osmotic method is said to be that it drives the medicine into the tissue, where in its passage it acts on an area below the surface which is not reached when a wash is used to irrigate or bathe the surface. I refer you to an article on this subject in the *Journal of the Allied Dental Societies* for March 1917; also to an excerpt from this article in the *DENTAL COSMOS* for May 1917, at page 563. The study of Riggs' disease is still going on, and several new factors are being considered as probable causes. The internal secretions is one, and bids fair to throw light on the subject.

It has been lately discovered that there is a great deviation in the juncture of the enamel and cementum at the gingival margin from an anatomical standpoint. Gunner Thorsen, an authority on this subject, says:

(1) That cementum covers part of the enamel in 60 to 65 per cent. of cases examined.

(2) That enamel covers part of the cementum only once in sixty-five sections made.

(3) That the tissues meet edge-to-edge in 30 per cent. of cases.

(4) That a gap between these tissues is found in from 5 to 10 per cent. of cases examined.

The importance of the gingival region for so many dental procedures makes this study very welcome and warrants further extension of such researches. Ipecac and its alkaloid has proved a failure in the cure of Riggs' disease, and has been practically abandoned. The alcresta tablets assist in elimination, and are still used to some extent. When the alcresta ipecac was first introduced, it was placed on the list of "New and non-official remedies" by the Council on Pharmacy and Chemistry.

Since then the preponderance of scientific evidence indicates that ipecac is of questionable value in Riggs' disease, and on the basis of this and other extravagant claims the council has found it necessary to omit alcresta ipecac from the list of new and non-official remedies. The above is set forth in the January 1918 issue of the *DENTAL COSMOS*.

ROOT RESECTION.

Apicoectomy is a surgical operation which has been put upon a scientific and successful basis. Where properly performed, it is a safe, sane, and practical operation. It seems to be the opinion of those who know, that when more than one-half of the apical third of the root is involved in the operation the prognosis is not so favorable. I refer you to two articles in which this operation has been fully set forth, and a set of instruments in the form of an illustrated unit laid down. One of these articles is by Earl Brooks, and may be found in the January 1918 *Dental Summary*. The other is by S. L. Silverman, and may be found in the March issue of the *National Dental Journal* for 1918.

Root amputation performed on the molars, especially in the superior maxillary, is also a practical operation, and in some cases proves not only successful, but adds years of service to teeth that would otherwise have to be extracted.

FOCAL INFECTION.

Oral local infection resulting in systemic disturbances has become the subject of much discussion. That systemic disturbances are caused from oral foci of infection has been conclusively proved, but in this as in everything else of supreme interest and importance, in the early stages of agitation the claims are carried beyond the limits of truth and reason.

I call your attention to a short, terse article in the November 1917 issue of the *DENTAL COSMOS*, by Alonzo Milton Nodine, which sums up the general thought on the subject in a nutshell. He says, in part:

(1) These infections may and most frequently do occur without giving rise to any local pain.

(2) Foci exist about the roots of teeth which have been supposedly well filled.

(3) Systemic effects are produced so gradually that the person thus afflicted is not conscious of any departure of his health from the normal.

(4) The presence of such foci of infection is usually not revealed except by either accidental or intentional diagnosis with the X-ray.

(5) Often these infections exist about the roots of septic teeth without giving any radiographic evidence of their presence, or manifesting any local symptoms.

(6) The effects of these local infections are produced so remotely, both in time and in place, from their origin that there is no apparent connection between the two.

(7) There is hardly a person over twenty-five years of age who has had dental treatment in which the pulp has been involved, who has not one or more of these apical infections. The older the patient, and the more dental attention received in the form of crowns, bridge work, and removal of devitalized pulps, the more foci of infection he may have.

(8) These infections are the ones most puzzling to the oral surgeon and diagnostician, and the ones that require his most skilful efforts to eradicate.

There seem to be local conditions in Riggs' disease that produce the same systemic conditions as those resulting from apical troubles. In fact, these conditions are proving to be so serious that no diagnosis for constitutional disturbance is complete until the oral conditions have been considered.

BRIDGE WORK.

Removable bridge work is now receiving much careful attention, and with the aid of the casting machine this form of bridge work is very favorably spoken of; many articles have appeared in the various dental journals setting forth its merits. Fixed bridge work with various forms of inlay abutments is also in use and is being discussed. One form, the pinledge abutment, seems not only practical but durable. The ordinary inlay abutment, without a pin to assist in bearing the stress, is a failure. Since the side-lights on focal infection in the oral cavity have been thrown on, we are all trying to get away from pulp destruction, and for this reason the above class of bridge work has received much attention.

Prosthesis in the way of artificial dentures has seen some wonderful improvements. I refer you to a series of articles running in the *Dental Digest*, commencing early in 1917 and still being continued. These articles are by Dr. Samuel G. Supplee of New York. The subject is "Closed-Mouth Impressions," and is not only interesting reading, but valuable as to facts. Artificial teeth have been very much improved, and to Dr. J. Leon Williams belongs the credit. Articulation by the Gysi method in combination with anatomical tooth forms seems to have solved the problem of successful artificial dentures.

NOMENCLATURE.

A word in regard to dental nomenclature. It seems that we are at sea without a rudder in regard to this most important department of our profession. Every writer seems to be at liberty to formulate and use his own terms. This has confused and mystified the ordinary reader,

and some form of scientific classification as to correct and intelligent terms should be instituted. There are many technical terms used in dental science today that are not to be found in the standard dictionaries, and the reader has to guess at the meanings. A committee from the American Academy of Oral Prophylaxis and Periodontology has been at work on nomenclature, with the following results, as taken from the December 1917 issue of the DENTAL COSMOS:

ORAL HYGIENE. That branch of hygiene dealing with the mouth.

ORAL PROPHYLAXIS. A term applied to any procedure designed to prevent disease conditions of the teeth and periodontal tissues, and to protect and preserve the general health. Such procedure may be instructional, orthodontic, surgical, mechanical, or medicinal. *Oral prophylactic treatment:* A systematized periodic treatment designed to maintain the health of the teeth and periodontal tissues.

PERIODONTOCLASIA. The process of destruction of the tissues immediately surrounding the teeth.

PERIODONTOLOGY. The study of periodontoclasia.

PERIODONTAL, or PERIODONTIC. Of or pertaining to the tissues immediately surrounding the teeth.

PERIODONTIA. That branch of dentistry devoted to treating abnormal conditions of the periodontal tissues.

PERIODONTIST. A dentist who practices periodontia as a specialty.

Next they give a classification of periodontal diseases, as follows:

PERIODONTAL DISEASES.

Recession. Atrophy of the gum margin and underlying tissues, resulting in exposure of the cementum.

Gingivitis. Inflammation of the gum margin.

Acute ulcerative gingivitis. Acute gingivitis, producing rapid superficial ulceration of the gum margin.

Suppurative periodontoclasia. Separation of the principal tissues from the cementum, with macroscopic formation of pus.

Non-suppurative periodontoclasia. Separation of the periodontal tissues from the cementum without the macroscopic formation of pus.

Alveolar periodontoclasia. Resorption of the alveolar process without separation from the cementum and without macroscopic pus formation.

Periodontal abscess. A periodontal abscess not primarily involving the periapical tissue.

I have given in full the above terms and definitions, as adopted by the Academy of Oral Prophylaxis and Periodontology, for two reasons; first, to show the importance of accurate nomenclature, and second, to illustrate the complexity of the subject. How much more complex the problem becomes when every writer assumes the right to formulate his own terms as well as his own construction as to definitions! I think it would be a legitimate undertaking for the National Dental Association, in connection with its research work, to settle this question as to terms by an official classification, especially of those terms now in use. For instance, Riggs' disease is known by dozens of terms. Root resection is called by some apectomy, by others apiectomy, others apicoectomy, by others trans-alveolar amputation, and, for all we know, a dozen other terms.

During the next year every member of this association will receive the *Journal of the National Dental Association*. There are about twenty-eight other dental journals published in the United States. Now let each member of this association take four of these in addition to the *National Journal*, and read them carefully and intelligently for the next year, and see if he does not agree with me that something is radically wrong with our nomenclature.

All dental technical terms should be derived from the Latin or Greek roots where possible, the same as in medical nomenclature.

203 COCHRAN BUILDING.

The Application of Surgery as One of the Four Basic Principles of Oral Restoration.*

(III.)

By JAS. KENDALL BURGESS, D.D.S., New York, N. Y.

(Read before the South Carolina State Dental Association, at its annual meeting, Columbia, June 1918.)

IT was my privilege earlier in the season to read a paper on oral restoration in which the effort was made to go beyond type and system and method and technique, and discover the basic and underlying principles upon which all these secondary matters must be based if we hope to attain the success that those dependent upon us for relief from their ills and deficiencies have the right to expect of us, and to point out the fact that, if there is any hope of standardizing our productions and our services, standardization must begin with these rock-bed principles and be builded upon them. I beg leave to quote the following passage from that paper:

The status of every tooth with which we have to deal and its investment as integral parts of the human organism compels our consideration and our treatment as a surgical undertaking; their function as parts of a mechanical apparatus requires our management as an engineering problem, and their potential esthetic value by reason of their prominence amid the features demands our care and attention from the artistic point of view. Add to these the requirement of good workmanship which must characterize every successful undertaking, and we have Surgery, Engineering, Art, and Workmanship as the four-square, rock-ribbed foundation upon which every successful effort at restoration must be based. We may vary methods and technique, but we cannot alter these principles.

It is my hope in the present discussion

to make some practical application of the first of these fundamental principles—that of Surgery—to the work of restoration.

To go into all the minutiae of surgical procedure as it applies to oral restoration would involve separate treatises on radiography, bacteriology, pyorrhea, root-canal work, exodontia, operative dentistry, general oral surgery, as well as many other subjects. These matters all are being continually investigated and the results recorded and discussed in our literature by specialists in the respective undertakings; and while it is true that in none of them, perhaps, are our findings complete, our thought settled and congealed, and our policies thoroughly determined, we are morally responsible for living up to the light we have and to the new light as it is revealed. It is not the province of this paper to go into the details of these subjects, but we shall hope to arrive at some general conclusions in reference to conditions and relations as they obtain in the oral cavity, and to establish some principles to guide us in our surgical procedures.

It seems pertinent to observe, first of all, that there are relations as well as conditions in the oral cavity. Whether or not any of us has harbored the thought that the tooth is a separate entity unrelated to the rest of the organism, many of us have treated it much as

* [This is the third paper (see our September and November 1917 issues) of the series by the author on the fundamental principles of oral restoration.—Ed.]

if this condition actually obtained. But the day has come when the tooth as much as any other organ or tissue must be considered as a part of the body, a cog as it were in the great human machine, subject to the same laws and exerting its own individual influence for good or ill. "I am fearfully and wonderfully made," said the Psalmist. Who shall say that our creation was ill-advised or imperfectly planned? And if we concede that Nature has planned wisely, how shall we have the temerity to treat in any but the most sacred manner all of the parts and relations and functions of her handiwork?

The well-being of the organism as a whole is the greatest concern of the healing art, and its achievement and maintenance must be the aim and the object of all our efforts and the only justification for any disturbance of its normal parts or relations or functions. So far as our dealings with these matters relate to their pathological-physiological status, present and prospective, they come under the head of Surgery, which is the cornerstone of our foundation.

How, then, shall we apply the first of these vital principles in our efforts at restoration? What, in other words, is the function of the surgeon and by what standards shall we appraise his efforts? Prophylaxis—if it were possible—should be the ideal of the surgeon; but the Great Physician said, "They that be whole need not a physician, but they that are sick." So it comes to pass that our patients do not find their way to us until pathological conditions already have been established. It becomes the mission of the surgeon, then—

To relieve these pathological conditions;

To obstruct their progress by every legitimate means;

To eradicate them whenever possible;

To discover and if practicable remove their cause or causes;

To relieve or destroy their effects;

To guard against their recurrence;

To promote the restoration and conservation of physical integrity and functional efficiency.

In its application to oral restoration,

surgery is divisible into three general departments: diagnosis, prognosis and operating.

DIAGNOSIS.

By diagnosis is meant the study of physical conditions and relations, not only as they obtain in the oral cavity, but in and pertaining to the organism as a whole so far as they bear upon the case in hand. In addition to the exercise of the mental faculties, the measures for diagnosis are physical, both as that term applies to the corporal or sensational—as ocular, aural, olfactory, digital—and to the material, as instrumental, thermal, luminous, radiographic, chemical, bacteriological. By some or all of these means we should discover and study the general character and relations and condition of the denture as a whole, of each tooth with which we are especially concerned separately, and of each of its tissues, as well as each of its investing tissues, individually.

We must take cognizance of the location, conformation and relations of the tooth, consider its functions and its ability to perform these functions either in its present status or aided by whatever assistance we may be able to render it. We must observe the enamel for imperfections, inherent or acquired through caries, erosion, abrasion, fracture, or mutilation. We must observe the dentin with reference to all of these vitiating influences and the area and depth of their destructive progress. We must study the pulp to determine the nature, cause and extent of any pathological development that may have occurred and the prognosis of such as remain vital. We must examine the cementum to discover, as far as possible, the results of mutilation from within in non-vital teeth previously operated upon, and of denudation, injury, or morbid process externally and especially at the root-ends. And we must study the peridental membrane to learn the extent, the proportion affected, and the cause of any destruction or injury that may have befallen it, the degree and progress of any morbid process that may obtain, and its prognosis in the light of the character and func-

tions of the tooth. We must observe the character of the gum tissue and the cause, extent, and progress of any morbid development. We must determine the inherent quality of the alveolar process as to density and resistance, and learn the extent, the proportion affected, and the cause of any pathological condition, and whether it underlies the gingivæ, embraces the socket wall in whole or in part, occupies the periapical region, or combines any or all of these locations.

Then must be considered the relations of the tooth, in the light of its functions, to these supporting and surrounding tissues, to its adjacent fellows, and to its antagonists. Tilting, torsion, lengthening, shortening, protrusion, retrusion, crowding, separation, tissue recession, mobility, and their extent and causes, and the nature, characteristics, and relations of the occluding apparatus—all are to be noted. Observation must be made of the presence of deposits from the secretions, accumulations of extraneous matter, and all the products and results of previous operative effort, such as fillings in the crowns or roots of the teeth, inlays, bands, crown restorations of whatever character, bridges, plates, and their retentive apparatus, retaining or stabilizing appliances, excision of roots or root-ends, etc. Likewise sex, age, systemic condition and requirements, physical appearance, habits in general and food habits in particular, care or carelessness and uses and abuses of dental equipment; courage or timidity with reference to anticipated pain or other prospective disagreeable features of operative procedure; mental, moral, and social status and environment, financial ability and responsibility, and details general and particular almost *ad infinitum* must be taken account of.

We cannot overestimate the importance of diagnosis. The best interests of our patients and the efficiency and durability of the results of our efforts in their behalf demand the closest scrutiny and the most accurate and definite knowledge to be obtained, by whatever means, of all the conditions and relations with which we have to deal. It is not

just to the patient nor fair to ourselves to deal with any uncertainties that can be cleared up by any means we can command for solving them. Innumerable combinations of the conditions and relations here enumerated will present from time to time, and their consideration leads to the second division of our surgical effort—prognosis.

PROGNOSIS.

The word "prognosis" in the accepted sense means a prediction as to the course and termination of disease or the outcome of events where elements of uncertainty exist and such course or outcome, being only partially if at all under control, is problematical. But I use it here to mean a consideration of the various end-result possibilities deduced from the diagnostic findings, and the planning of a policy or course of action by means of which a definite and predetermined result is to be obtained by operative procedure. Prognosis on its intellectual side is a complex of the two important mental attributes, judgment and intuition.

Coincident with physical diagnosis is the operation of that intellectual ability or capacity to dissect and analyze the results of our observations and findings, to differentiate between cause and effect, to comprehend conditions and relations, to weigh circumstances, to estimate values, to compare prospective advantage with disadvantage, to foresee possibilities, to determine requirements, to summarize and co-ordinate data, and arrive at conclusions through the exercise of that whole train of mental processes which we sum up in the one word "judgment." And beyond judgment there is that intangible, intellectual something which we call intuition—a sort of second sight or spiritual discernment; the mysterious power of penetrating into the inwardness of things where the eye cannot see nor reason give proof; a peculiar and indescribable quality and qualification of mind—instinctive, elemental, often without basis in reason, but transcending reason;—the inexplicable endowment that enables your wife for example to say, "Don't lend money to

that man; you'll never get it back." This is intuition.

The application of all these mental attributes and activities is comprehended in prognosis and must be brought to bear in collating and co-ordinating the data gathered in diagnosis and establishing some definite end-result as the object of our further surgical procedure, the details of which necessarily will depend in large measure upon this determination. The possibilities in a given case happily are not always confined to one end-result. There is frequently latitude for the achievement of personal preferences on the part of operator or patient without a violation of the fundamentals.

It seems pertinent at this point to say that we must always recognize the patient's ownership and inherent rights and give due consideration to his mental attitude as well as to his physical requirements. A wide range in predilections and aversions is to be met with, such as the desire for the prospective restoration for practical or esthetic purposes; objection to removable appliances on account of their annoyance or through fear of detection; objection to pulp removal on general principles or for specific reasons, as fear of pain or prospect of resulting discoloration of the tooth; preference as to size and color of porcelain substitutes, objection to display of metal for esthetic reasons—these and many others. Patients have rights to opinions on these matters, and we must at least give them careful consideration even if the necessities of the case will not always admit of our putting them into execution.

But prognosis, as here employed, is more than a mere intellectual process. Here the heart interest comes into play, and who shall dare to leave out this vitalizing and spiritualizing influence and reduce the conduct of his affairs to the sordid basis of dollars and cents? It has frequently been said that there is no sentiment in business. God help that business of which it is true! Whoever leaves sentiment out of his business loses a great and ennobling opportunity for

soul-cultivation—and this is especially true of the practice of any branch of the healing art. There are circumstances and conditions under which service becomes a virtue and where virtue must be its own reward. All these circumstances and conditions must be reckoned with in prognosis.

OPERATIVE PROCEDURE.

Some wise head has said, "Be sure you are right and then go ahead." This comprehensive diagnosis and prognosis lays the foundation for the operative procedure which is the third division of our surgical effort. In other words, having secured and studied the data, formed our conclusions, and determined upon a plan of action, we proceed to put it into effect. Our operative surgical effort proceeds under two heads—corrective and preparative. The function of the corrective measures is to establish, as far as possible, physiological conditions and relations in the field of operation. These corrective measures are further subdivided into two classes—destructive and constructive.

Destructive corrective measures deal with all pathological conditions and processes and their producing causes, and have to do with the removal from pulp chambers and canals of gangrenous and necrotic tissue, morbid tissue past recovery, and the degenerated portions of their lining walls; carious and degenerated tissue from the cavities or external surfaces of teeth, degenerated peridental tissue and all products of deterioration, secretion, excretion, and accumulation, whether found on the crowns, necks, or roots of teeth, especially in pyorrhea pockets; necrotic portions or areas of the alveolus; the apices of roots and accompanying or surrounding products of degenerative processes, where indicated; mechanical appliances and devices of every description and all the products of previous operative effort, already enumerated, when productive of irritation or deterioration in any of the tissues of the teeth or their investments; tooth tissue or artificial material productive of oclu-

sal trauma or interfering with occlusal accommodation; denuded roots; tooth crowns where deterioration, mutilation-malformation, or malposition render them unfit for service, and finally teeth and roots themselves where on account of their condition or relations, or both, the necessities of the case, either as they pertain to local requirements or to the systemic well-being, demand it.

Constructive corrective measures comprehend such procedures as are necessary to the completion of the work of putting the field of operation in a physiological condition after the destructive corrective measures have been put into effect; such as the treating and filling of root-canals and the attendant work of radiography, filling operations necessary, apart from the bridge restoration, in crowns or necks of teeth being operated on; and any therapeutic measures, medicinal or mechanical, for the stimulation of sluggish tissues and fostering the relations between the tooth and its supporting tissues, whether applied by the patient or the operator.

The teeth and tissues in the field of operation being now to the nearest attainable degree in a physiological state, we are ready for the second and final part of our operative surgical program—the preparative. Our preparative effort has two purposes in view—alterative and prophylactic. The alterative procedure has for its object the altering and shaping of the teeth or roots or both, of the foundation, as anchorage abutments for the reception and retention of the attachments of the superstructure. This is accomplished by the forcible removal by grinding, burring, chiseling, etc., of tissue from such parts of the tooth or root as will provide room for these anchoring attachments.

This alteration has to do chiefly with the enamel, the dentin, and the pulp. Where destructive processes, either morbid or physical, have attacked these tissues and wasted their substance the operator's task and his responsibility are to use to the best advantage what remains of the foundation. But where they are intact the occasion for altera-

tion by tissue destruction is frequently a dilemma for the operator of the true surgical instinct. He is confronted on the one hand with one of the outstanding principles of true surgery—the *conservation* of physical integrity and functional efficiency as they apply to these foundation teeth and tissues; and on the other, with an equally important function of surgery—the *restoration* of physical integrity and functional efficiency by means of the proposed superstructure. He must weigh each case, therefore, in the balance of cost and accomplishment, and determine whether the prospective benefits to be derived from the proposed restoration will be worth the sacrifices their achievement will entail.

PROPHYLAXIS.

The unnecessary destruction of vital or useful neutral tissue is as much a miscarriage of the surgical function as is the retention and harboring of morbid tissue. Here is brought into service the second purpose of our preparative effort—prophylaxis—which has a broad and comprehensive mission. Our consideration at present is with pathological-physiological conditions, and if, as is presumed, our corrective procedures have left the tissues of the teeth and their investments in the field of operation in the nearest approach possible in the circumstances to the normal, from that point of view, it is evident that our alterative procedures, being destructive of tissue, are tending in the opposite direction.

The first mission of prophylaxis, therefore, is to act as a check on tissue destruction by this alterative procedure, with a view to keeping it within such limits and location and of such form as that the remaining portion of the tooth will be subjected in the least practicable degree to injury by accident, violence, or deterioration. Its protecting and conserving influence must encompass everything pertaining to the tooth. First, conformation—because it is with the peripheral conformation that the important relations of the tooth with its an-

chorage, its adjacent fellows, and its antagonists are all established, and it is by means of these relations that its chief functions, viz, mechanical efficiency, mutual support, protection to the soft tissues, and the esthetic function, are performed, so that in conserving the conformation we maintain these relations and foster function. It must be agreed, therefore, that the greater the alteration by tissue removal the greater the difficulty in reproducing anatomical conformation by artificial means, and so in re-establishing these relations and maintaining the tooth functions.

Next, prophylaxis must concern itself with the individual tissues of the tooth and their relations and functions. The tissues chiefly concerned in the work of preparation, as already said, are the enamel, the dentin, and the pulp. The relations and interdependence existing between these three tissues and the influence of their integrity upon the organism are of grave importance. The enamel affords protection to the dentin; the dentin supports the enamel, determines its color, and houses and protects the pulp; the pulp nourishes the dentin and maintains its vitality, and guards the periapical region—and the welfare of the periapical region is of vital consequence to the entire organism. It is easy to see, then, how injury to any of these tissues may be of serious import to any or all of the others, and, through the connecting link of the periapical region, to almost any and every organ and tissue of the body.

The destruction of vital tissue and the disturbance of normal relations and functions for any other purpose than to satisfy the superior demands of the organism as a whole is a gross violation of surgical principles, whether it be an amputation, a laparotomy, the extirpation of the pulp of a tooth, or the removal of its enamel. All unnecessary surgery, however perfect the technique of its performance and whatever the apparent result, is bad surgery or worse. Mechanical excellence of performance does not necessarily constitute good surgery. Brilliancy unbridled is a danger-

ous thing. Good surgery is a matter of the heart and of the head as well as of the hands; it comprises a moral perception of its need or desirability and an intellectual conception of its requirements and its possibilities, as well as manual dexterity in its execution. And these are attributes and qualifications not always shown in radiographs, even though the radiograph does exhibit the results of apparently perfect technique.

An oculist performed an operation with beautiful technique for the removal of an eye, but at its conclusion it was discovered to the horror of everybody concerned that he had removed the good eye. The unnecessary removal of the dental pulp with the destruction of its function and the mutilation or destruction of the tooth crown are less tragic only in degree. The principle involved is as gross a violation of Nature's rights and prerogatives which every true surgeon is in duty bound to respect.

It is the function of prophylaxis to guard against these injuries to the tissues, so pregnant with possibilities of evil to the whole organism. The question "What constitutes injury?" naturally arises. In a strict sense any alteration of vital tissue or of normal form or function is an injury; but since all preparation necessarily involves alteration it seems fair to define an injury, within our meaning, as the removal of pulp or hard tissue which is not made necessary in the effort to supply a superior need of the organism, or any alteration carried to the point of danger, physical or pathological, to such pulp or tissue. These, of course, are variable quantities, and the circumstances of the particular case as revealed in diagnosis must guide us. But we cannot afford to treat with little concern any of Nature's handiwork. In the Divine economic scheme nothing is of small consequence:

For want of a nail the shoe is lost,
 For want of a shoe the horse is lost,
 For want of a horse the rider is lost,
 For want of a rider a battle is lost,
 For want of a battle a kingdom is lost.

In the light of all this, what shall we say of those intrepid individuals who,

with an arrogance and a confidence born of ignorance, commit that abomination of desolations—the entering of the sacred domain of this vital pulsating, life-sustaining guardian of the gateway to the vascular system, and with spears and hooks tearing it asunder, leaving at best uncertainty in its wake, and frequently the periapical space a prey to infection with its dynamic of evil to the entire organism, when the welfare of the whole systemic economy is crying out for the surgeon to save the pulp and protect this sacred entrance to the highways that lead to all the organs and tissues of the body.

It may as well be said here as anywhere else that there are a great many plain mechanics in the dental profession who look at everything from the mechanical point of view, use everything in a purely mechanical way, and discard indiscriminately, when occasion offers, everything that stands in the way of such use or that does not lend itself readily to it. A tooth pulp is to them but an undesirable alien occupying room desired for the insertion of a split post or some cunningly devised appliance used in the construction of the sliding-trombone type of bridge. Then, to add insult to injury, they prate about anatomical conformation and normal occlusion and prophylaxis. One, long ago, characterized their achievements in fitting language, "For ye are like unto whited

sepulchers, which indeed appear beautiful outward, but within are full of dead men's bones and of all uncleanness." Then we have another class who believe that the pulp has served its purpose and completed its work when the patient arrives at maturity, and that it is dangerous to leave it in the tooth because it might die sometime or other. "So let's take it out," they say, "and put in a rubber nerve; nothing can happen to that." Such profanation of Nature's handiwork serves but to throw the intellectual incapacity of its irreverent practitioners into bold relief. It is a travesty on surgery, a hideous misshapen thing without intellect or soul. Real surgery is a vital thing, strong, active, virile, resourceful, throbbing with power, yet tender as a mother's heart. The human mouth is so wonderful; its teeth and tissues are so full of individual and community interest; there is so much of drama always in their relations, so much of poetry at their best and of tragedy at their worst, that when misfortune befalls, and some effort at re-establishment of their normal conditions and relations and functions becomes necessary, it is a task worthy of the highest attainments in intellect and skill and of the deepest reverence and devotion capable to the human heart.

149 BROADWAY.

Trench Mouth and Its Treatment.

By JOSEPH E. REDDEN, Lt.D.C., U.S.N.R.F., Pauillac, France.

U. S. NAVAL AIR STATION, PAUILLAC, GIRONDE, FRANCE.

DENTISTRY, like all professions and industries, has its after-war problems. Not the least of these will be the care and treatment of so-called "trench mouth" of home-coming soldiers and sailors.

This infection attacks indiscriminately the crews of the destroyer flotillas, the soldiers in the trenches, and to a lesser extent the men in the supply service.

The conditions predisposing to this infection, which is indistinguishable from stomatitis ulcerosa (cancrum oris), are lack of oral prophylaxis, causing tartar accumulation and gingival irritation, and affording perfect lodging for the infective bacteria.

The patient in the early stages presents himself complaining of a sense of discomfort around the gingival margins of the teeth. There is invariably swelling, redness, and loosening of the gum tissue. This condition, unless it receives immediate treatment, progresses rapidly. The gum festoons loosen, the gum margins become swollen and congested, partially covering the teeth and forming large pockets; hemorrhage is readily provoked. Frequently, in a space of twenty-four hours the swollen and congested gum tissues will break down and slough away, leaving an angry ulcerated surface. This ulcerating may extend rapidly to the deeper tissues of the cheek, and in neglected cases may also involve the periodontium, causing necrosis of the alveolar process and loss of the teeth.

The milder infection will show practically no tendency toward febrile conditions, but in serious cases with extensive

ulceration the temperature runs high and does not subside until the conditions are improved.

Under the microscope, smears from infected mouths stained by the Giemsa method show the large fusiform bacillus and delicate spirillum of Vincent's angina. The fusiform bacilli are of two types, one slender, blue, with darker spots at each end, the other thick and of uniform color, maroon in hue. If the material is mounted in saliva, a very slight motility of the bacillus may be noted.

This describes in essence the oral conditions which have been a source of so much worry and discomfort to many in the American expeditionary forces. This condition has been slow to respond to treatment, seemingly resisting all medicinal applications.

Having recently some success in the treatment of this infection, I believe the history of the treatment may be worthy of note:

Patients generally present themselves with such ulceration and soreness that cleansing of the mouth at this time is an aggravation, if not an impossibility. In these cases a 5 per cent. sulfuric acid solution is applied with a swab over all ulcerated surfaces twice daily. Invariably after two or three days the pain has abated to such a degree that it is possible to scale the teeth. A little scaling is done at each visit for several days, continually applying the 5 per cent. sulfuric acid solution.

After the mouth is cleansed of tartar, the following treatment is carried out: The mouth is irrigated, after which the gums are protected with aseptic gauze.

The ulcerated surfaces are touched with 5 per cent. sulfuric acid solution, although I have used as high as 10 per cent. in some severe cases with beneficial results. Then each pocket is pumped full of the 5 per cent. sulfuric acid solution, and the patient is dismissed with absolute orders in regard to oral prophylaxis.

In a few cases intravenous injection of neosalvarsan has accomplished wonderful results in hastening a cure, but is impractical owing to the large number of patients requiring treatment. The time required for treatment of the cases is short. The pain and discomfort disappear in a few days, or in a week at the

most. An absolute cure then depends upon how carefully the patient follows his instructions in oral prophylaxis, although, under the sanitary environment of many of the men, they are much handicapped in this respect.

It might be well at this time to state that if the men leaving the United States left with clean mouths, no deposits of tartar, and all old roots and rough tooth edges removed, more would be done to overcome this infection than all possible treatment in France.

The above is a brief history of the treatment of over nine hundred cases of this oral infection at a U. S. naval aviation base in France.

CORRESPONDENCE

Procain Anesthesia.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—The November 1918 issue of the DENTAL COSMOS contains a contribution by Stephen P. Mallett, D.M.D., of the U. S. navy, entitled "Procain for Dental Operations." There are so many errors and such inconsistency of thought there expressed that I cannot let this opportunity pass without pointing to these errors as evidence of a basic misunderstanding of the subject on the part of Dr. Mallett.

On page 967, Dr. Mallett says, in speaking of needles used in conduction anesthesia: "It is better to use iridio-platinum needles, because it simplifies matters in that they do not need to be boiled before using, can be used again, and are always mounted and ready. Iridio-platinum needles should be sterilized in the flame. . . . Steel needles are not so applicable because they break rather easily, oxidize, rust, and must be boiled just before using, which requires

considerable time. However, because of the liability of needles to break off while injecting, I think it better to use steel needles for conduction anesthesia, because when broken off they are more easily removed surgically. A powerful magnet may be used for removing them."

I would like to ask Dr. Mallett whether he wishes to convey the thought that iridio-platinum needles are best, as he says in the opening lines of the above quotation, or whether he really thinks that steel needles are best, as he says, with apparent contradiction, in the very same paragraph. Surely this was no compositor's error! Just one more criticism at this point: Why refer to the removal of a broken needle by the aid of a powerful magnet as a "surgical" operation?

Under the heading "Preparation of the Patient," Dr. Mallett says he advises the use of nitrous oxid analgesia to prevent the pain incident to the inser-

tion of the needle used for inducing conduction anesthesia. Strange experiences, indeed, must the doctor have had! One of the compelling features of conduction anesthesia is the opportunity it affords for the painless introduction of the needle into the deep areas for the deposition of our anesthetic solution. In infiltration anesthesia we naturally have pain in proportion to the resistance offered by the tense mucosa into which such injections are made as a rule; but not so with the injection of procain into the mucous folds, which permit of easy penetration with almost no pain.

On page 970, I note an error in anatomical fact: "The buccal nerve supplies the buccal part of the gum. It is also a branch of the mandibular division of the fifth cranial nerve." If Dr. Mallett will consult the pages of a standard textbook of anatomy, he will learn that the "buccal part of the gum" is not supplied by the buccal nerve, except as herein-after described, and that the buccal nerve, above all, is not a branch of the fifth cranial nerve, but a branch of the seventh cranial nerve. Speaking now of the innervation of the buccal mucous membrane lining the mandible, in a varying proportion of cases, the buccal or buccinator nerve supplies sensation to a crescentic area extending from the bicuspid to the third molar area. In the

majority of cases, however, anesthetization of the inferior dental division of the fifth cranial nerve is sufficient to anesthetize the buccal mucosa covering the mandible. Where, after a waiting period of such length as to permit the operator to note that there is anesthesia at the cuspid prominence, there is insufficient anesthesia in the bicuspid or molar region, one is forced to make a supplementary injection to reach the buccal nerve.

Farther on page 970, under the heading of "Technique," Dr. Mallett says: "Palpate the postmolar triangle with the tip of the index finger of the left hand and with the tip of the thumb of the right hand, with the remaining fingers held outside of the cheek, fixing the jaw." If Dr. Mallett means just what he says, then I must confess that the description here given for the palpation of the postmolar triangle with more than one finger-tip is most clumsy. The index finger of one hand is all-sufficient. Surely he need not enjoin us from putting the "remaining fingers" into the mouth while palpating, because with the index finger of one hand and thumb of the other hand both introduced into the patient's oral cavity, surely the latter has a mouthful, to say the least.

Respectfully,

M. HILLEL FELDMAN.

616 MADISON AVE., NEW YORK, N. Y.

"Dentist or Stomatologist?"

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—The article in the November 1918 issue of the DENTAL COSMOS entitled "Dentist or Stomatologist?" offers several suggestions which should be seriously considered by all progressive dental surgeons. The proposal to substitute the title stomatologist for dentist, with the consequent broadening of the scope of the dentist's operations as represented by the new title, is one which has appealed to me strongly since graduation from

dental college. There seems to be a desire upon the part of many dentists, and particularly the more recent graduates, to cast off the limitations which the term dentist denotes—a desire to learn more about surgery and medicine in its relation to the treatment of oral conditions. In order to satisfy this desire many men take special courses of study after graduation; others enter hospitals, and others, who are not in a position to follow either of these courses, devote their spare time

to private study. Aside from this, the present-day course of study in the dental colleges has broadened to such an extent that the term dentist does not do justice to the man bearing that title. There is a disposition upon the part of the public, and, to a lesser extent now than formerly, upon the part of the medical profession, to concede only a knowledge of the teeth to the dental profession. Thus, regardless of the experience and knowledge of medical matters a dentist may have, he is given credit merely for the ability to perform those operations to which the early status of the dentist limited him. We as a profession have outgrown the early conception of dentistry. Have we not therefore outgrown the title of dentist?

The growing spirit of co-operation between the medical and dental professions further demands that the dentist become a stomatologist, not only in title but in the scope of his knowledge. Although custom has made it the province of the physician to treat all oral conditions except those purely dental, I am quite sure

that most medical men would be willing to refer all oral conditions to the stomatologist. During my year of service in the oral surgical department of the Philadelphia General Hospital, I was pleased to note the readiness with which the medical men placed all oral and jaw cases in my hands. It indicated to me a growing respect for the abilities of the dental surgeon, and this attitude will be exhibited toward all who demonstrate their right to the title of stomatologist.

Dr. Broomell has placed before the profession a proposal the early adoption of which will favorably influence the future status of the dental surgeon. Let us hope that the profession will not be slow in recognizing the need and advantages of such a change, to the end that dentistry may enter the ranks of the medical specialties, a position which its progress warrants.

Very truly yours,

ARTHUR S. MACMILLAN, D.D.S.

*Former resident dental surgeon,
Philadelphia General Hospital.*

JERSEY CITY, N. J., November 9, 1918.

Painless Pulp Extirpation; Fractured Roots Remaining in the Jaw.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Will some savant in the dental profession enlighten me on these perplexing problems?

(1) I am perfectly able to extract any tooth in the mouth painlessly under novocain infiltration anesthesia, but I fail many times to painlessly extirpate pulps of lower bicuspid and molars by the same identical process. What causes the difference?

(2) I have had several cases in my practice where teeth were broken off during extraction at about the lower third of the root, due to very thin or

curved roots. After a few weeks, I was surprised to find the gums perfectly healed over these roots, and giving the patient no trouble whatever. I was under the impression, as many others are, that gums will never close over any fragment of root left in the jaw. This happens in the majority of cases. But why did the gums close over in these particular cases? Is any harm liable to arise to the patient if these fragments of roots be left in the jaw undisturbed?

Yours truly,

HERMAN AUSUBEL, D.D.S.

BROOKLYN, N. Y.

A Trouble in the Casting of Gold Inlays.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Will some reader of the DENTAL COSMOS enlighten me as to the cause of small holes in gold inlays at the "sprue"? I am using an air-pressure machine, and every now and again I find a small "blow" just at the sprue end where this joins the inlay. It is not caused by an air-hole in the investment, and seems to me to be a lack of metal in the casting.

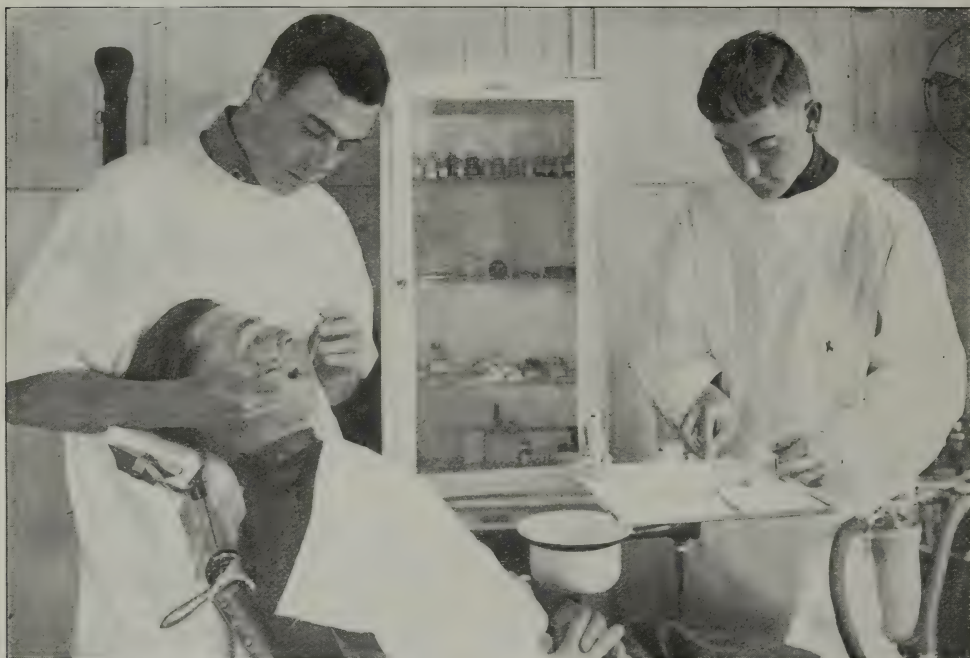
I was under the impression it was caused by the larger bulk of metal in the contracting mass of the nugget drawing metal up the sprue and taking it from the inlay. This I now think to be wrong. Can someone aid me in my error?

Yours faithfully,

J. C. SWAN.

HASTINGS, N. Z.

American Red Cross.



The dentist at the American Red Cross military hospital No. 5, at Auteuil, France.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDWARD C. KIRK, D.D.S., Sc.D., LL.D., *Editor.*

L. PIERCE ANTHONY, D.D.S., *Associate Editor.*

PUBLISHED BY THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Virgin Islands, Cuba, and Mexico. Canada, \$1.40. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the EDITOR, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, JANUARY 1919.

EDITORIAL DEPARTMENT

"The Wonderful Year."

AMERICA has just passed through what will in all probability be eventually recorded as the most momentous year in the history of the world, yet we are now entering upon what will undoubtedly in many ways prove the most critical year in history.

The energies of the United States have been directed to the prosecution of the war in a manner which has been the astonishment and admiration of the world; the goal has been reached more quickly than the most sanguine had hoped, and all that we aimed for is apparently assured.

The democratization of the world, the professed aim of America in entering the war as laid down so clearly by the President in his declaration of principles, which were accepted by all the Allies

without reserve, has been the battle-cry of America; and now, with the victory won, the whole world faces the most serious aspect of war—the reconstructive period. All the resources which have been mobilized for the prosecution of the war are now being marshaled for the reconstructive period, and the eyes and hope of suffering humanity the world over are centered on America.

The collateral development of the resources of the medical world was necessary to prosecute our war program, and the medical world has responded nobly to the call and has willingly done its share in the great work. Probably for the first time in the history of the profession, dentistry has been given full opportunity to prove its claims as one of the most important branches of the healing art, and the manner in which it has responded is a source of sincere gratification to all. We have beyond question proved the wisdom of the Government in establishing the Dental Corps on a similar basis to that of the Medical Corps, and its subsequent act in increasing the dental *personnel* to meet the demands upon it by reason of the enormity of the task. The Dental Corps has gladly and eagerly taken up that task, and has co-operated with the Medical Corps in such a manner as to call forth the unstinted praise of the medical world.

The impetus for good in the moral uplift of the profession as well as the material development of the Dental Corps may now be utilized in ways that will shed additional glory on the profession. The utilization of this potent force for the welfare of humanity can best be exemplified in the rôle that we shall doubtless be called upon to play in the coming reconstructive period, in the further and needed development of our profession along scientific lines. American Dentistry has long stood out prominently as a leader in the dental world, and now we have the opportunity to make more firm our place in the sun by the capitalization of the experiences gained in the closing war for the benefit of humanity.

Oral surgery has received an impulse that should go far in establishing that branch of our profession on a basis such as it has never known before. The scope of oral surgery has never been definitely demarcated even by those practicing it, but in the past four years oral surgery has established its right to a definite field of activity, and there are wonderful opportunities ahead for development of the field and enlargement of the scope thereof. The

value of the services of the oral surgeon in conjunction with those of the general surgeon has been abundantly shown by the report of the Inter-Allied Dental Congress held in Paris in 1916, which is a lasting literary monument to the surgical ingenuity and ability of the dental profession.

Now that we have received proper recognition from the Government, the medical profession, and the public, we can devote our energies in the future more assiduously to our educational and scientific development. It is too soon, the world is too unsettled, to say what is coming in the future or what is to be done, but the rôle that the dental profession will be called upon to play in the social problems that are to arise will doubtless be of considerable magnitude. Dentistry will surely exert much influence in weaving the new social fabric, and a realization of this should impel an appreciation of a stronger organization of the profession within itself. The influence the profession will wield in the important reconstructive period will doubtless enable it to secure more fully and completely its rights and recognition, but let us not forget in our altruism that dentistry must guard its own rights; dentistry's development should be along autonomous lines, free from the domineering influence of a group of medical meddlers, supercilious self-appointed saviors of the dental profession, who have been too prone to regard dentistry merely as the vermiform appendix of the medical cæcum.

We confidently look forward to the coming year as the most potential for good that the dental profession has ever known, and our record of the past assures the outcome.

The spiritual development of the glory of sacrifice and the joy of service will make us eager to accept the opportunity which the future year offers. Hail and welcome to 1919 as the most wonderful year in the history of dentistry!

BIBLIOGRAPHICAL

THE SURGERY OF ORAL DISEASES AND MALFORMATIONS, THEIR DIAGNOSIS AND TREATMENT. By GEORGE VAN-INGEN BROWN, D.D.S., M.D., C.M., F.A.C.S., Major, Medical Officers' Reserve Corps, U. S. Army, Oral Surgeon to St. Mary's Hospital and to the Children's Free Hospital and Columbia Hospital, Milwaukee; Fellow American Medical Association, Member National Dental Association, Chairman Section on Oral Surgery, Fourth International Dental Congress, etc. Third Edition, with 570 engravings and 20 plates, and a selected list of examination questions. Philadelphia and New York: Lea & Febiger, 1918. Price \$7.00.

The appearance of a new edition of this work within a year indicates its popularity. The illustrations are numerous, excellently chosen and executed, and very interesting. The subject-matter of the book is developed principally from the clinical side. The section on "trench gums," or Vincent's infection of the oral mucosa (pages 156, 169), in view of the marked attention it has recently attracted, needs revision and a more adequate presentation. It is regrettable that the author retains the inaccurate and obsolete term "hereditary" in the description of syphilis (page 107).

The doctrine of oral infectious foci of systemic disease is stated, without warrant, almost exclusively in terms of Rosenow's theory of selective tissue affinities of various streptococcic strains, and

their transmutability. In this connection it is interesting to be apprised of the status of Rosenow's views among those best qualified to judge. Park and Williams ("Pathogenic Micro-organisms," 1917, 6th ed., p. 252) in respect to the transmutability of streptococci, remark that "The recent work of Rosenow . . . calls for confirmation. Such a transformation has not been proved to occur in any other types as distinct as these have appeared to be." These authors do not even mention the "elective localization" of these organisms. In another standard work we read (Hiss and Zinsser, "Textbook of Bacteriology," 1918, p. 351): "Judgment on this point of view ('elective localization') must for the present be held in abeyance, yet it seems to us more likely that specific localization of streptococci . . . may find an explanation in the hypersusceptibility of individual tissues to the organisms." On the other hand, Adami ("Medical Contributions to the Study of Evolution," Macmillan, 1918, p. 43) apparently accepts Rosenow's views upon the elective localization of streptococci; but as regards their transmutability he is in essential agreement with Park and Williams as noted above.

The technique of extraction (except for some remarks on the removal of impacted teeth) is probably not considered pertinent to the general character of this book. Resection or removal of the root-apex in chronically infected teeth is mentioned, but no details are given.

The subject of cleft palate and hare-lip receives elaborate consideration.

The most important changes in this edition are to be found in the chapter relating to War Surgery of the Face and Jaws. This is an attempt to summarize and co-ordinate the enormous mass of recent literature on the subject. The novelty, multiplicity, and diversity of the data naturally complicate the making of such a summary.

THE NORMAL AND PATHOLOGICAL HISTOLOGY OF THE MOUTH. Being the Second Edition of "The Histology and Patho-Histology of the Teeth and Associated Parts." Revised and Enlarged. By ARTHUR HOPEWELL-SMITH, L.R.C.P.Lond., M.R.C.S.Eng., L.D.S.Eng., Professor of Dental Histology, Pathology, and Comparative Odontology, University of Pennsylvania, Philadelphia; John Tomes Prizeman of the Royal College of Surgeons of England, etc. Vol. I: NORMAL HISTOLOGY. With 2 colored plates and 262 illustrations in the text, including 149 original photomicrographs. Vol. II: PATHOLOGICAL HISTOLOGY. With 394 illustrations in the text, including 343 original photographs and photomicrographs. Philadelphia: P. Blakiston's Son & Co., 1918. Price, each volume, \$4.50.

Since the days of the conception and lusty infancy of modern dentistry (1839 *et seq.*) no other period has been as significant as that marked by the fifteen years which have elapsed since the first appearance of this work. The function of dentistry in the social economy has received articulate expression and unquestioned acceptance. The vision of the profession has broadened, and with this has come revision of its standards and

aims. Its development has definitely passed from the stage of empiricism and mere estheticism to that of science. The rationalization of dental practice (this is so true that it is trite) is dependent upon, and is controlled by, the correctness and the fulness of our understanding of the development and minute anatomy of the dental and oral tissues in health and disease. For these reasons a revised and enlarged edition of the original work was not only desirable, but its need had become imperative.

The form of this American edition has been changed by the logical and convenient division of the work into two volumes. Each volume is complete in itself, although the second supplements the first in a field of more obvious interest to the practitioner, but the content of the first is indispensable to an adequate grasp of the second. The publishers have sensed the unusual character of the work and have loyally co-operated in all details to fittingly present this masterly epitome.

In comparison with the second volume, the first (dealing with normal histology and odontogenesis) shows relatively few alterations from the first edition. In passing, note must be made of the author's views on the structure of the cementum. According to Hopewell-Smith this tissue is composed of almost structureless laminae, devoid normally of lacunae and canaliculi. These views, although convincingly supported, need emphasis, as they have not to any extent found general recognition. The problem of the termination of the sensory nerves in the teeth is extensively considered. The author comes to a conservative conclusion—a "strong conviction that these (nerve) fibers terminate in a basketwork of varicose fibers embracing

and often closely attached to the cell walls of the individual odontoblasts." Unfortunately no account is taken of the work of Fritsch (*Arch. f. mkr. Anat.*, 1914, 84, pp. 307-20), which might warrant a modification of the above conclusion. Likewise, the work of Schweizer, describing lymphatics in the dental pulp and apparently corroborated by Dewey and Noyes (*DENTAL COSMOS*, 1917, p. 436) is not accepted as proving the presence of such structures. No reference is made to Schweizer's later work (*Arch. f. mkr. Anat.*, 1909, 74, p. 927).

The treatment of the subject of the histogenesis of dentin serves to emphasize one of the most original views of the author. He denies to the classical "odontoblast" the function of mediating in the production of this tissue, which function is ascribed to "certain round cells of the pulp of an osteoblastic nature." Although these views have been held since 1889 and have been forcibly presented, they still remain unaccepted and even unnoticed in the descriptions of dentin-formation usually presented to the student. For example, Schaeffer ("Textbook of Microscopic Anatomy," 1912, Part 1 of Vol. II of Quain's Anatomy) makes no mention of Hopewell-Smith's views in this particular. Also the latest editions of Piersol and Gray are silent on this point. The paragraphs pertinent to this important problem should terminate this period of negligence and indifference. The more recent studies of Bolk (*DENTAL COSMOS*, 1913, p. 1058) and Ahrens (*Anat. Hefte*, Bd. 48, Heft 2, 145 Heft. Erste Abt. 1913), apropos of the structure of the enamel-organ, particularly in primates, are not considered.

To the practitioner the second volume (dealing with pathological histology) will make the more direct appeal. The changes from the first edition have been more numerous and of a more significant import in this volume. Six additional chapters have been added which embody "specially revised accounts of original researches undertaken by the author in recent years." Several new pathological conditions—among which are nanoid dentin, odontoceles (extra- and subcapsular), diphyodontic gemination, hydropic degeneration of the oral mucosa, and fibroid degeneration of the alveolo-dental periosteum—have been for the first time observed, investigated, recorded, and named.

The observations on the dental tissues encountered in ovarian teratomatous cysts form a contribution unique to this book. They are important as illustrating the dystrophic possibilities of dental tissues developing under abnormal conditions. The absence of any sign of dental caries in such teeth emphasizes the well-acknowledged fact that at least one etiologic factor or group of factors in this disease is dependent upon the oral environment.

No description is given of the condition described as "mottled teeth" by Black and McKay (*DENTAL COSMOS*, 1916, pp. 129, 477, 627, 781, 894, and 1918, p. 831). Perhaps the section most closely related to this subject is that on the pigmentation of the enamel.

Attention must be particularly focused upon three of the alterations in the second volume of the second edition. In the first place, the description of the pathological condition usually with ostentatious impressiveness termed a "granuloma" is deliberately omitted. "A

so-called 'granuloma' does not conform to the correct definition of a tumor, and is in no sense a new growth, being merely one form of granulation tissue, the result of chronic inflammation of the periodontal membrane. . . . There is nothing, either from a clinical or pathological point of view, to justify the application of the term to chronic inflammation of the alveolo-dental periosteum, or its retention in modern dental literature." The soundness of this attitude is indubitable. The current prevalence of the term "granuloma" signalizes a pathologic myopia.

In the second place, the chapter on "Pyorrhea Alveolaris" gives in full the author's original investigations which have established the primordial importance, in the etiology of this condition, of the alveolar atrophy. The infection of the altered structural substratum is a secondary and incidental phenomenon.

In the third place, the chapter on "Oral Bacteriology" has been replaced by one on "Oral Microbiology" by Nathaniel Gildersleeve, M.D. It seems an oversight that the authorship of this chapter is nowhere mentioned in the second volume, which may be and probably will be purchased separately by many. There is no other phase of pathology quite so essential to an understanding of the various oral and dental lesions as that dealing with the microbic factors, because the objective symptoms, at least, of the vast majority of cases (dental caries, gingivitis, and affections of periodontal structures) coming to the dentist for relief are directly attributable to these

agents. The same sound judgment and freedom from bias which characterized Gildersleeve's section on the bacteriology of pyorrhea alveolaris in Kirk's American Textbook of Operative Dentistry is found in this present contribution. Its author's wide theoretical and practical familiarity with pathological phenomena assured the substantial and permanent nature of this summary. Hopewell-Smith has admirably and succinctly characterized it as "*le dernier mot* with regard to the science of this branch of oral and dental pathology; it is authoritative, perspicuous, comprehensive, important, and valuable."

If the positive be translated into the superlative, this critical judgment becomes applicable to the ensemble of the two volumes. Oral structures and conditions, normal or abnormal, are inherently difficult of analysis. The usual methods and armamentarium of the microscopist often are unavailing; intricate modifications are necessitated. The nature of the material, frequently to be found only in the human being, for the most part exclude experimental control; and inference by analogy is consequently unsatisfactory or impossible. To this subject has been attracted the closest thought of a century paramount in scientific endeavor. The product of this devotion and energy, logically collated, presented with unsurpassed fulness and clarity, rigidly controlled and materially amplified, constitutes the work in hand. The genius which animated the labors of Hunter, Kölliker, Owen, Tomes, and Miller has again been potent in the genesis of this book.

AN INTRODUCTION TO THE MAMMALIAN DENTITION. By T. WINGATE TODD, M.B., Ch.B.Manch., F.R.C.S.Eng., Capt. Canadian Army Medical Corps; Henry Willson Payne Professor of Anatomy, Western Reserve University, Cleveland, Ohio; formerly Lecturer in Anatomy, Victoria University of Manchester, England. With 100 illustrations. St. Louis: C. V. Mosby Co., 1918. Price \$3.00.

Comparative odontology is a subject which is either ignored or relegated to a very secondary position in the American dental curriculum. A number of considerations would seem to justify the belief that this attitude has not been wise. From the so-called practical standpoint, we recall the important observations of Miller on pulpal inflammation and the deposition of secondary dentin, which observations were made on the extremely favorable material afforded by the proboscidean incisor. The possibility opened for the interpretation of various atypical dentins by analogy with that tissue in lower vertebrates is not unknown. Likewise in certain cases of aberration from the normal in size, shape, number, and even position of the teeth, it is not illogical to refer to conditions found in other than human forms of life. The rationale of the correct nomenclature of man's dentition can only be fully appreciated when the student has the comparative viewpoint.

It is peculiarly opportune to speak of another and broader phase of comparative odontology. The desirability of introducing a cultural element into dental education is unquestioned, and none of the subjects which can with propriety be called dental offers more signal opportunities in this direction than does the

field which inspired Owen and Tomes. Vistas through paleontology into geology are opened. The biological principles of evolution and of adaptation, in particular, find abundant illustration.

Ideally, the dental student, proceeding in the truly scientific manner from the known to the unknown, might be led from the human dentition to that of the primates before extending his observations to the mammals in general and eventually embracing all the vertebrates. Todd limits his attention to the mammalian dentition, giving only as much of the dentitions of the lower vertebrates as is necessary for orientation.

From the evolutionary standpoint, interest in the mammalian dentition is focused upon three general problems—(1) the origin of diphyodontism, (2) the origin of heterodontism, and (3) identifying the homologies of the teeth, *e.g.* which of the four premolars of the typical mammalian dental formula are represented by man's two premolars. The first two of the above problems involve a reference to the ancestry of the mammals; the third problem concerns primarily the mammalian orders. As in any other evolutionary quest, there exist, for each of these, three directions of investigation—(1) the evidence afforded by paleontology, (2) by ontogeny, and (3) by the comparative anatomy of recent species.

Although in the chapter on the Deciduous Dentition the question of diphyodontism cannot be avoided, and although the subjects of heterodontism and homologies are inseparable from the content of the chapter on the Ancestry of the Mammalia, Todd has as far as possible subordinated theoretical discussion to a simple presentation of the coronal topography of recent forms.

This is the wise policy in an elementary book such as this claims to be. In many ways the projection of the biogenetic principle into pedagogical practice is valid. The collection and description of the obvious and more easily accessible data is the invariable prerequisite to the drawing of generalities and the construction of theories.

In the light of the above paragraphs it is possible to analyze Todd's book. Primarily it is a description of the coronal topography of the teeth of recent mammalian species. The data of ontogeny are almost entirely dispensed with. The evidences of paleontology are introduced only where necessary to interpret or correlate the living types. He accepts without hesitation the Cope-Osborn theory (trituberculy), clothed in its most modern guise, as a fundamental basis of mammalian tooth forms.

Back of this primary purpose, the author utilizes the material furnished thereby "to illustrate three fundamental principles of life: The marvelous potentiality for adaptation exhibited by organisms in general through the continual creation of the absolutely new; the occurrence of adaptations always in one of several definite directions; the frequency of pause, reversal, or secondary progression—in other words, the discontinuous character of evolution."

As to the first of these principles, the meaning of "the continual creation of the *absolutely new*" is not at all clear. Literally, "continual" is in contradiction to the third principle. "Creation" is a word which would be avoided by one familiar with pre-Darwinian literature or that produced for the decade after 1858; only recently has it again come into vogue through the transcendentalism of Bergson. And "absolutely" is a

very strong word, especially if taken in its strict sense, with which to qualify "new" in matters of evolutionary import. If these two words are to connote a variety which becomes persistent, however necessary such an event may be theoretically, there is still no positive evidence for it. (Bateson, 1913, "Problems of Genetics," Yale Univ. Press.)

It must be remembered that however unsatisfactory and even absurd (*vide* Adami, 1918, "Medical Contributions to the Study of Evolution," Macmillan, p. 6 *et seq.*) are the conclusions arrived at by the dominant school of students of variation, of which Bateson is a representative, those conclusions are the only ones justified by the facts as yet known. The appearance of an "absolutely new" variation would mean the addition of an "absolutely new" unit character or factor to the germinal plasm, which phenomenon has not been unmistakably recognized by professional students of variation and heredity.

The second of Todd's principles is clearly obvious in the comparative odontology of the mammalia, *e.g.* in the marsupials. It is a principle which marks Cope's influence on American vertebrate paleontology. Its interpretation and significance have aroused endless discussion. Its explanation involves in the first place a decision as to the origin of variations, whether the initial stimulus to vary was intrinsic or extrinsic. Recently, Ruedemann (*N. Y. State Mus. Bulletin*, 196, 1916), from a study of persistent invertebrate types, holds that the evidence "leads necessarily to the general conclusion that there is no inherent propelling force of variation or of development, and that all evolution in the last analysis is largely dependent on the exterior agencies supplied by the

ever-changing physical conditions, which stimulate the four inseparable factors of evolution (heredity, ontogeny, environment, and selection)." Also Adami, from a study of variation in the bacteria, asserts the importance of the extrinsic stimuli.

The third principle is one of the most important paleontological generalizations. There has been no universally accepted answer to its "why." Ruedemann (*op. cit.*) looks upon it as a necessary and confirmatory corollary to his explanation of the second principle.

In spite of the attention given to these principles in this review (because they may be considered as cultural phases of the study of comparative odontology), it must be remembered that in the text they occupy no such relative space or important position. They are modestly confined and never developed at the ex-

pense of the anatomical description of facts. Two particularly interesting chapters are those on the Anomalies of the Human Dentition and on the Roots of Teeth. On this latter subject there is a paucity of recorded data.

The only serious objection to be made to the book, and this is very serious, is that the illustrations are almost without exception on far too small a scale. Fig. 56, on p. 159, is the only one that is at all satisfactory. Where the structures concerned are so minute, no pains should be spared to make them visible clearly and without conscious effort. No criticism is to be made of the technique of reproducing the photographs. Most of them if enlarged three diameters would leave little or nothing to be desired. In other respects, the appearance and workmanship of the book are excellent.

PRACTICAL HINTS

This Department specially welcomes the brief presentation by our readers of any novel suggestions or methods which in their own practice have proved to be time-saving or to possess other features of advantage.

An Easy Method of Applying Iodin.

By W. H. SAVAGE, D.D.S., Clifton Forge, Va.

THE tincture of iodine, either in the form of Talbot's iodo-glycerol solution for various forms of gingival inflammation or the discoloring solution in prophylactic work, or in combination with aconite-capsicum as a counter-irritant in

periosteal disturbances, can best be applied with the aid of wooden applicators. These may be procured from any druggist in the form of wooden sticks about 12 inches long and 1½ mm. in diameter. A small wisp of cotton twisted around

the end of the applicator enables one to apply the iodine without danger of corrosion of steel instruments. The end of the applicator is broken off and dis-

carded as used. This I have found to be a convenient and clean method of using a drug which has a tendency to spread over the mouth.

The Use of the Matrix as an Aid in Contouring Anterior Teeth with Gold Foil.

By **LEON C. PATTERSON, D.D.S., Lincoln, Nebr.**

IN cases where anterior teeth are unusually close together, and where one or especially two cavities occur on approximal surfaces, where reasonable separation is not sufficient, and where sufficient separation is impractical for perfect results, a thin strip of steel may be employed to good advantage.

After the cavity or cavities are properly prepared and the rubber dam is in place, insert the matrix, without retainer of any kind, between the teeth. In cases where its use is indicated, pressure of the teeth will retain it in place. The matrix may be bent backward, in the direction away from the cavity.

Condense the foil in the usual way, at the same time condensing it against the matrix, paying no attention to the matrix. When condensation has been completed, remove the matrix and rubber

dam, and by the use of the separator with very slight pressure sufficient space may be had to permit of the use of thin burnishers and fine sandpaper strips, with surprising freedom.

Very little effort is required to finish the filling on the approximal surface and at the same time produce the necessary contact.

By the use of the matrix as described, much inconvenience in finishing the lingual margin is avoided and a great deal of time may be saved.

Where two approximal cavities occur it is only necessary to see that the width of the matrix is sufficient to extend beyond the margins of the adjoining cavity. This adjoining cavity may be packed with cotton or gutta-percha to better support the matrix, but this is not necessary in most cases.

BASE HOSPITAL, FORT BAYARD, N. M.

A Safe Way of Using a Separating Disk.

By **CHARLES OGUR, D.D.S., Brooklyn, N. Y.**

To prevent injury to an adjoining tooth in preparing for crowns, place a metal disk on the side of the separating

disk which comes in contact with the adjoining tooth. I use an old lightning disk (DeSanno) for that purpose.

REVIEW OF CURRENT DENTAL LITERATURE

[*British Dental Journal*, London, October
15, 1918.]

The Technique of Pyorrhea Treatment with Medicated Pastes. BY J. T. HALL.

Where this form of treatment is indicated, either to combat the infectious factor in the symptomatology of the disease or to stimulate a return of normal tissue tonicity, there are two principal phases to be considered: (1) The suitability of the paste and (2) its proper introduction. Its suitability depends upon its *composition* in respect to the pharmacological action of its constituents and upon its *consistence*. Its consistence must be the first consideration and its composition second. Hall believes that the composition will vary according to the individual case, and consequently he makes no specifications. He is convinced of the uselessness of stereotyped formulæ of advertised nostrums. The consistence must be such that the paste does not wash away quickly in the oral fluids; on the other hand, it must not be so impervious that it remains insoluble and inert.

For the proper introduction of a paste the first step is the preparation of the pocket. From this all food débris is removed; it is syringed with an antiseptic wash, and hemorrhage stopped by alum wool or strips of white blotting paper soaked in strong tannic acid solution. This also serves to dry the pocket. The greatest attention should likewise be paid to the thorough drying of the cementum. To summarize, preparation of the pocket for the proper insertion of the paste consists in (1) cleansing—removal of food débris, etc., (2) stopping of hemorrhage, and (3) thorough drying of the pocket, especially the cementum.

The paste must be carried to the remotest recesses of the pocket. For this purpose Hall uses ball-pointed broaches of different calibers (made by tipping soft-tempered smooth

broaches with solder), and soft-wood tooth-picks rubbed to a feather-edge on fine sand-paper, and mounted in a broach holder (Hall finds orange-wood too hard).

[*Journal of the American Medical Association*,
October 12, 1918.]

The Lymphatics of the Dental Region.

BY FREDERICK B. NOYES AND KAETHE W.
DEWEY.

In the DENTAL COSMOS (April 1917, p. 436) these authors reported an investigation which was limited to a consideration of the lymph supply of the pulp. They therein indubitably demonstrated the presence of lymph vessels in the pulp. The purpose of the present work was to follow the course of the outflowing vessels, to examine the extent of their communications with neighboring tissues, and to study their course in the mandibular and infraorbital canals. They succeeded in corroborating and in slightly extending Schweitzer's observations (*Arch. f. mkr. Anat.*, 1907, 69, 807; 1909, 74, 927). The work of Noyes and Dewey supplements in two particulars the results of Schweitzer—(1) in showing the injection of the lymphatic vessels in the inferior dental and infraorbital canals, and so showing the complete course of drainage to the submaxillary nodes; (2) in showing the same course by injections only into the pulps of teeth.

The lymphatics of the gingival surface of the gingival trough penetrate the ligamentum circulare and extend toward the apex of the root in the periodontal membrane.

In the periodontal membrane the connective tissue accompanying the bloodvessels and nerves is seen to contain many injected lymphatics. These continually anastomose with vessels in the spaces of the bone. At the apex of the root the vessels anastomose with lymphatic vessels which accompany the

bloodvessels through the foramina in the cementum into the dental pulp.

The lymph vessels from the pulp pass through the apical "space" into the spaces of the bone, anastomosing with the rich lymphatic network in this tissue. The vessels pass to the periosteum, but drain to the inferior dental canal in the lower jaw and the infraorbital in the upper jaw. Here they form a rich plexus around the bloodvessels and in the sheaths of the nerve trunks. The vessels pass out of the mental and infraorbital foramina, in a superficial course, and follow the facial artery and vein, passing to the large submaxillary lymph nodes.

[*Journal of the American Medical Association*, November 9, 1918.]

Microscopic Studies of Diseased Peridental Tissues. BY EDWARD H. HATTON.

Most of the material on which this report is based is from relatively advanced cases. Zenker's fluid was used most often for fixation. Paraffin-embedding was selected as a routine measure. Serial sections were cut. Staining was with hematoxylin and eosin, methylene blue and eosin, or occasionally methylene blue alone.

An early alteration in the epithelium is its tendency to project into the sub-epithelial layers. Along the basement membrane of these slender projections in the adjacent tissues there are regions of infiltration, usually of the small round-cell or lymphocyte type. It is a chronic or low-grade inflammatory process. With the extension of the pocket these epithelial projections become deeper and more chaotic. Surface continuity is lost, and the deeper portions are subject to retrograde metamorphoses.

The sub-epithelial regions are characterized by inflammatory infiltrations, which are invariably perivascular. The infiltrating cells are most often of the small, round-cell type. There are large numbers of plasma cells, occasional eosinophils, and polymorphonuclear leucocytes. Unattached endothelial cells are frequently seen. The vascular supply is very rich. The walls of venules and capillaries are often thickened. Many of these vessels are filled with polymorphonuclear leucocytes, to the exclusion of the erythrocytes.

The fibers of the gingivæ and of the peri-

odontal membrane seem very susceptible to the destructive action of these forces.

Histologically, bacteria have not been demonstrated in these tissues in any large number of cases. The forms resemble those of the streptococci quite constantly found in pus pockets. Generally they lie about the vessels which are surrounded by the cell infiltrations already described, and are more frequently disclosed near the bottom of the pocket.

The distribution of these pathologic changes seems compatible only with the notion that they exactly parallel the distribution of the lymphatics in the same region (*vide* Noyes and Dewey, *DENTAL COSMOS*, April 1917, p. 436).

[*Bulletin de l'Académie de Médecine*, Paris, May 28, 1918.]

Sialophagia of Central Origin. BY GEORGES HAYEM.

By sialophagia, Hayem designates that particular form of aerophagia in which the patient fills his digestive tube with air by swallowing a more or less considerable quantity of aerated saliva. Sialophagia is of very frequent occurrence, and is the habitual cause of that morbid state formerly named flatulent dyspepsia.

Clinically there are two forms—(1) of peripheral origin and (2) of central origin, which is the particular subject of the present note. Hayem has observed it in neuropathic patients affected with a parapsychosis. He concludes with a description of its occurrence in a general paralytic, male, forty years of age.

[*Medicine and Surgery*, St. Louis, June and July 1918.]

Case of Hypopituitarism. BY WM. ENGELBACH AND J. T. TIERNEY.

This is a very elaborate and detailed history of a case of pre-adolescent, non-neoplastic, bilobar hypopituitarism in a boy of sixteen. From the dental standpoint it is of interest to note the oral conditions. The mucosa was well colored. There was some dilatation of the superficial venules. No pigmentation was seen. Posteriorly the tongue was coated. The teeth were very soft. The maxillary first incisors show a very peculiar formation, a marked hollowing and indentation. Their lateral portions were pointed. The mandibu-

lar incisors showed a marked serration and a transverse ridging. The rest of the teeth were poorly developed, and showed a tendency to be soft. Fig. 5, which is to illustrate the dental conditions, is too small to be of much value.

[*Proceedings of the Royal Society of Medicine*, London, January 1918. (Section for the Study of Disease in Children.)]

Congenital Malformation of the Left Temporo-maxillary Joint and Both Hip Joints. BY A. S. B. BANKART.

Case. Girl, age five years. Left condylar process was fused with the base of skull and the zygoma. The left hip was typical of Calvé's disease (osteochondritis). The same condition in the right hip was more advanced; complete destruction of head of femur and coxa vara.

[*Tijdschrift voor Tandheelkunde*, July 1, 1918.]

A Relation Between the Periphery of the Cranium and the Form of the Dental Arch. BY A. A. H. HAMER.

A. LeR. Johnson ("The Law of Occlusion and the Normal in Orthodontia," *Items of Interest*, November 1918) strongly urges that the individual, rather than the species, be considered the unit in establishing the norm. If this viewpoint be accepted, then, for its full development, the individual must also be considered as an entity, *i.e.* that various parts and functions constituting this whole exhibit measurable correlations. This concept is not at all new. Early in the nineteenth century it was emphasized as the "*loi de balancement*." Its dental aspects are reported upon by Johnson and Hatfield (DENTAL COSMOS, 1917, p. 599) and by Spier (*American Anthropologist*, January-March 1918, and DENTAL COSMOS, 1918, p. 899).

The three cases which Hamer reports illustrate one of these correlations, which is also accepted as an aid in recognizing the individual orthodontic norm. The periphery of the skull is outlined on paper by means of the instrument used by hatters in taking measurements. This outline is looked upon by Hamer as the constant to which the dental arch must be made to conform. The part of the outline considered in particular is that recording the region of the forehead.

Measuring from the mid-point of this outline in front, back to a point which is somewhat arbitrarily chosen to terminate the frontal region, we would find a right and left frontal segment of this outline. The relative lengths of these segments alone are referred to by Hamer. If the right be longer than the left, then orthodontically the right half of the dental arch needs expansion or the left half needs reduction. Apparently the author has not instituted an exact quantitative study of this relationship, and his criterion of success is the rather indefinite one of personal esthetic satisfaction.

Whatever the judgment of time be upon the reality and trustworthiness of this "norm" in orthodontic treatment, it appears quite certain that, as Hamer has qualitatively noticed, there exists at least in certain cases a definite relation between the form of the skull periphery and the form of the dental arch. Although at variance with Hamer's assumption of the constancy of the former, an explanation of this parallelism is one suggested by the observations of Johnson and Hatfield (*loc. cit.*).

The marked disparity between the gnathodynamometric readings of the right and left sides in certain cases of malocclusion indicate a like disparity in muscular tonicity and force which, considering the plasticity of bone, is not likely to be without influence upon the contours of the areas of insertion of the temporal muscle, *viz.*, areas which are crossed by the line of the cranial circumference.

[*Journal of the American Medical Association*, November 9, 1918.]

Suppurative Gingivitis with Alveolar Involvement: A New Surgical Procedure. BY ARTHUR ZENTLER.

The condition to which Zentler refers is pyorrhea alveolaris. This latter term to him is a "confusing name"—though wherein his own nomenclature is more exact or appropriate is not obvious. For his purposes, he prefers to call the diseases involving the gingival and their soft and hard underlying and adjacent tissues by Talbot's generic name of gingivitis. Further, he empirically subdivides these gingivitides into superficial, hemorrhagic, and suppurative types.

The first type and the less advanced forms of the second and third types are ordinarily

amenable to instrumentation, in conjunction with correction of such local and constitutional disturbances as may be present.

The more advanced hemorrhagic cases, and especially the advanced suppurative cases, require for a successful termination resort to the surgical procedure presented in this paper. In such cases the condition present is such as to indicate nothing short of radical removal of all the involved soft and hard structures, going well into healthy surroundings.

It is advisable to place the mouth in as hygienic a condition as possible before this operation, *e.g.* root-canals should be properly filled. Root resections may be performed at the same time as the operation. Conductive anesthesia with procain-epinephrin is employed. The parts are swabbed with tincture of iodine. A flap is prepared by two parallel incisions, starting at the cervical free border of the gum, and carrying them apically to the apical region on each side of the area over the teeth involved. The incisions penetrate the mucosa, submucosa, and periosteum. This flap is lifted with the raspatory and retracted. All the inflamed, infected, granulomatous tissue found between and surrounding the roots is removed with suitable curets and knives. With delicate chisel and mallet the alveolar plate is chiseled away from around the denuded portions of the roots. These are well curetted. Rough edges of alveolar bone are smoothed. Inflammatory or granulomatous tissue is curetted from the inner surface of the flap. Disturbance of healthy periosteum is carefully avoided. The parts are washed with physiologic sodium chlorid solution, and swabbed with a 50 per cent. solution of the official tincture of iodine. The wound surfaces are freshened and the flap replaced and sutured. Sutures are taken at each end of each incision, one near the cervical end, the other near the apical end. If more than four teeth are involved, one or two additional sutures are taken between the teeth. Any necrotic areas on the free edge of the flap are cut away with scissors. Before dismissal of the patient the parts are again swabbed with tincture of iodine and covered with a strip of iodoform gauze, which is changed once or twice every twenty-four hours. Sutures usually can be removed on the fourth or fifth day.

Ordinarily no discomfort follows the operation. All areas of the mouth, without ex-

ception, can thus be operated on. Where there is much suppuration it is well not to operate over more than three or four teeth at one time, so as to avoid encouraging septic absorption.

[*Bulletin de l'Académie de Médecine, Paris, August 27, 1918.*]

Anatomical Demonstration of the Triple Origin of Human Incisors. BY MARCEL BAUDOUIN.

The evidence here adduced is from prehistoric material: Two maxillæ were discovered from a neolithic ossuary. In the first specimen, the age of whose owner was between two and one-half and four years, the crown of the permanent first incisor showed very distinctly division into three parts, an internal, an external, and a central. It was a tricuspid tooth, with a trifurcated cingulum. The second specimen was quite similar, that of a younger individual, and showed the central division of the cingulum more distinctly than did the first specimen.

Baudouin interprets these facts as confirmatory of his hypothesis that the human incisor was originally formed of three dental germs which have fused together. While this interpretation is within the realm of possibility, the facts lend themselves as readily as a demonstration of a widespread tendency to triconodonty, which has been advanced and strongly argued by Cope and Osborn.

[*Journal of the California State Dental Association, San Francisco, November 1918.*]

The Use of Hypochlorites and Chloramins in Dentistry. BY RUTH F. HOREL.

This article is in the nature of a tentative or preliminary report. The number of cases presented for treatment have been few, treatments were often irregular, and antiseptics other than Dakin's have sometimes been used just before the treatment in question was commenced.

In treating pyorrhea, Dakin's solution, chlorazene, and dichloramin-T have been used. Dakin's solution and 1 per cent. chlorazene were employed as an irrigant and as a mouthwash.

When 2 per cent. dichloramin-T was used, it was applied as a twenty-four-hour dressing after irrigation with one of the aqueous solutions. A piece of sterile gauze, saturated with

the oily solution, was packed lightly in the pocket, and held in place by a ligature.

In chronic alveolar abscess, with or without fistula, the pus tract was irrigated with either Dakin's solution or 1 per cent. chlorazene. A sterile cotton point saturated with 2 per cent. dichloramin-T was sealed in with cement for twenty-four hours.

After root resections the wound was irrigated with Dakin's solution or 1 per cent. chlorazene. A sterile gauze pad saturated with 2 per cent. dichloramin-T was then applied daily for four or five days. Irrigation was continued for another week.

The results obtained from the treatment of four pyorrhetic cases and four alveolar abscess cases were not encouraging. In one instance, a control case of pyorrhea, treatment with physiologic salt solution yielded results similar to those treated with Dakin's solution.

After root resections, the antiseptics gave better results. Of four cases, all healed without suppuration. The bacteriological count decreased from 12 bacteria to less than 1 in twenty fields.

[*Bull. et Mém. de la Soc. de Chirurgie de Paris*, May 28, 1918.]

(1) Lingual Lipoma—Case, and (2) Multiple Oral Malformations. BY H. MORESTIN.

(1) This case was that of a man beyond sixty years of age. He suddenly became aware of a fair-sized tumor on the right half of his tongue. This growth was regularly circular in outline, delimited, firm, indolent to pressure. The overlying mucosa was unaffected. The tumor was removed under local anesthesia, and proved to be a lipoma. This condition of the tongue is a rarity, and the difficulty of diagnosis was enhanced by the depth of the growth, which did not permit it to give its usual sign, a yellowish tint through the mucosa.

(2) The second of these two contributions concerned a girl of eleven months. In this patient the multiple malformations may be itemized as follows: A deep median fissure of the upper lip, a bifid tongue, and multiple lipomata of the tongue and of the floor of the mouth. The parental and prenatal histories were negative. The labial notch is

partial, only involving at most a third of the height of the lip. The defect is not of the nature of hare-lip. No teeth have erupted, and there is no sign of their immediate eruption. The tongue is fixed throughout almost its whole extent to the floor of the mouth by a short, stout frenum. The anterior part of the tongue is divided by a furrow distinctly into a right and a left half. The lipomata are easily recognizable through the mucosa by their yellow color.

[*American Journal of Medical Sciences*, Philadelphia, October 1918.]

An Operable Tumor Involving the Gasserian Ganglion. BY CHARLES H. FRAZIER.

This paper is really a concise analysis of the recorded cases of "tumors of the Gasserian ganglion." This term is misleading, since with few exceptions all tumors so designated are tumors of the middle or posterior fossa, with only coincidental involvement of the ganglion and not infrequently of other contiguous nerves.

The patient whose case served to introduce this analysis was a man of fifty-three years. The case is of interest for two reasons: (1) The operation was performed within three months of the appearance of symptoms, and (2) the growth was limited in size and well within the bounds of "operability." Pain was felt in the distribution of the second division of the left trigeminal nerve, which had been "jumpy" at first, later becoming more intense. Numbness in the upper lip followed, and was associated with or followed by neuralgia above the left eye. The case was thought to be one of trigeminal neuralgia. Two alcoholic injections only partially relieved the pain.

Radical operation for removal of the ganglion was undertaken. The approach was made by Frazier's usual technique (*vide* DENTAL COSMOS, 1918, p. 829). Overlying the ganglion was an almond-shaped, encapsulated growth, firmly adherent in the region of the second division and of the sensory root. The tumor was removed *in toto*. The specimen measured 2.5 x 1 x 1 cm. Microscopically it was an endothelioma. The results were eminently satisfactory. The patient was discharged eight days after the operation. After the lapse of fifteen months, apart from certain paresthesias, which might well have been

due to the avulsion of the sensory root, there were no signs of recurrence.

In this report, the case of Percy (DENTAL COSMOS, 1918, p. 941) is not included. Frazier's experience with such tumors includes 3 of 43 reported cases (Percy's would make 44), or 3 of the 13 (14) cases in which the tumor was exposed on the operating table. These tumors preponderantly occur between the ages of twenty and fifty years, with an even distribution for each of the three decades therein included. The left side is affected more than twice as many times as the right (Percy's was on the right side). The great majority of these cases have been either sarcoma or endothelioma. In Frazier's experience, the proportion of cases of trigeminal neuralgia, so called, to tumors involving the Gasserian ganglion is about 100:1; i.e. Frazier has seen but three cases of tumor to over 300 cases of neuralgia.

Symptomatically, the tumors of the Gasserian ganglion are, at least in the early stages, often confused with "tic douloureux." In tumors there is often a combination of pain and anesthesia; the pain more frequently involves the entire distribution of the fifth nerve, is of greater severity, and usually without the intervals of freedom so characteristic of trigeminal neuralgia. In tumors the corneal reflex is often absent; the muscles of mastication are affected; other cranial nerves, particularly the third and sixth (in Percy's case, the seventh) are implicated; and there are the neighborhood symptoms and signs of increased intracranial tension.

To the 3 (of the 13 operative cases whose descriptions have been found by Frazier) in which the tumor was strictly within operable limits and in which there were no operative fatalities, must be added a fourth, that of Percy's.

[*Journal of the American Medical Association*, November 23, 1918.]

Paralysis of the Sixth Cranial Nerve Associated with Otitis Media (Gradenigo's Syndrome or Triad). BY JOHN M. WHEELER.

Gradenigo's syndrome is characterized by (a) acute otitis media with or without external suppuration, and with or without mastoid reaction; (b) isolated paralysis or paresis of the abducens nerve of the side

corresponding to the diseased ear, and (c) intense and extraordinarily persistent pain localized, not as ordinarily in the mastoid region, but in the frontal, temporal, and parietal regions of the same side.

Pain in the areas supplied by the trigeminus is caused by involvement of the Gasserian ganglion, and is described as neuralgic in type and very severe. There may be severe toothache, and there may be areas of hyperesthesia or of anesthesia. Herpes sometimes occurs. The muscles of mastication supplied by the inferior maxillary branch of the trigeminus may manifest contractions or paralyses.

This article is quite rich in references to the literature. The second of Wheeler's own cases is the only one having a dental interest; a girl of five, whose gums were so sore on the right side that she could not chew.

[*British Medical Journal*, August 24, 1918.]

Case of Pyorrhea Alveolaris Treated by Emetin. BY GEO. P. BLETCHLY.

The patient was a young woman of twenty-six years. All her teeth were loose, and pus was escaping from all the sockets. The gums were swabbed twice daily with ipecacuanha wine. On 19 consecutive days 0.5 grain of emetin hydrochlorid was given hypodermically. The mouthwash was changed to

Emetin hydrochlorid,	0.5 grain;
Sodium chlorid,	5i;
Water, to make	5viii.

This was used with one and a half times its quantity of warm water, three times daily. Gradually the hypodermics were stopped (apparently having given in all twenty-four injections). The patient was apparently cured. In this note there is no mention of instrumentation or any local treatment except the use of the two above mouthwashes.

[*New York Medical Journal*, November 2, 1918.]

Reflex Convulsions During Dentition. BY CHARLES ROSENHECK.

The only case referred to is one under the care of S. A. Jahss. The child experienced a series of convulsions with the eruption of every tooth. Its health was impaired. The number of attacks increased with each succeeding tooth, and the intervals between the

spasms became so short that the convulsions were almost continuous. The last attack lasted twenty-seven hours. During this entire period the child was never relaxed; clonic convulsions were followed at once by tonic spasms in the entire somatic musculature. Heroic medication seemed unavailing. The coma was absolute, and the signs of increasing intraventricular pressure were quite manifest. By lumbar puncture about 45 cc. of fluid were withdrawn under a good deal of tension. The convulsions stopped, the muscles gradually relaxed, and the child fell into a quiet slumber of several hours' duration. There was moderate stupor and a state of muscular asthenia in the ensuing twenty-four hours, followed by complete and uninterrupted recovery.

Rosenheck does not advocate so radical a method as a routine measure. He would reserve it for those rare cases where other simpler measures fail, where the convulsions persist, and an acute hydrocephalus develops.

[*Dental Record*, London, September 1918.]

A New Departure in the Construction of Obturators. BY RAGNAR ECKERMANN.

The obturator consists essentially of three portions—(a) a cylinder to serve to attach the apparatus to the palatal margin of a denture from which go (b) three spiral springs to form the framework upon which is stretched (c) rubber tissue.

The cylinder is made of gold plate 0.4 mm. thick. In Eckermann's case it served to attach by means of an anchor the obturator to a vulcanite denture. With slight modification it could be adapted to a metal denture, either cast or swaged. The cylinder was reinforced with one or two hoops of gold wire soldered around it.

The principal spring was about 0.5 cm. in diameter, made of 18-k. gold wire 0.2 mm. in diameter. This spiral was so curved as to fill the soft palate fissure at its maximum extension. Its general position was horizontal with a downward slope distad. Its outline was approximately ovoid. The two other spiral springs function as accessory to the principal spring, serving to support and guide the position and movements of the latter. They lie in the vertical plane, one going from the top of the cylinder, and the other from the bottom, both to attach to the horizontal spring at its midpoint. The lower stay-spring is of a more flexible nature than the upper. The springs are attached by means of fine gold lashings. No soldering should be used. The ends of the lashings must be carefully hidden.

Over the springs and cylinder are drawn two thin rubber bags, to form the bulk of the obturator. These can easily be replaced, even by the patient himself.

The principal advantages claimed by the author for this appliance are—

(1) The spring-obturator exactly fills up the palatal defect, even when the cleft is at its maximum extension.

(2) It has the same elasticity as the natural palate.

(3) Under lateral pressure it narrows, and consequently extends in a backward direction until it reaches the pharyngeal wall.

(4) After being compressed it instantly resumes its previous form.

(5) To the palate, tongue, and parts of the cleft it feels supple and of natural softness.

(7) It is light in weight and comfortable for the patient, and does not burden the muscles.

PERISCOPE

To Protect Synthetic Cement Fillings from the Saliva.—Instead of using wax or the varnish supplied by the manufacturers, use ordinary surgical collodion; it is cheaper and better.—CECIL NORTON, *Commonwealth Dental Review*.

Bone Spatulas.—In the present hard times due to the war, we dentists are asked to practice economy. If one is in want of some bone spatulas for mixing cements, one has only to use discarded toothbrushes after cutting off the bristles. They are certainly inexpensive, and last longer than those we usually buy.—W. H. GRIFFITHS BAKER, *British Dental Journal*.

Washing Amalgam.—Washing amalgam has been advocated, but there seems to be no good reason for it, and it is certain that there are good reasons for not doing so, such as loss of time and interfering with crystallization. Objections have been urged against manipulation in the palm. The bases for such objections are not sufficiently well founded to overcome the advantages gained in strength of the filling and working properties where palm manipulation is used.—C. M. MCCAULEY, *Dental Summary*.

Supernumerary Teeth.—Woman about thirty-five appears for the extraction of a supernumerary tooth lying lingually to the upper third molar. She has already had eight teeth taken from the same place. I extracted the ninth. A well-developed third molar remains. On the other side of the mouth she has a well-developed third molar, with two supernumeraries to the lingual of it. These teeth are about the size of a deciduous first molar. They have one root. They all have enamel, dentin, cementum, and pulp.—E. J. PERRY, *Dental Review*.

Tempering Explorers.—Heat one of your flask bolts to a cherry red, and at a point one-quarter of an inch from the sharp point of your explorer lay it on your red-hot flask bolt. Watch your steel instrument very closely. It will first turn to a light straw, then darker until it gets a beautiful pigeon

blue. Then the instrument should be immersed in water and the temper is perfect; the point will not rust. I prefer the tip end of the point to be a straw color. When you want to make a sharp angle, hold the instrument in the flame, and bend at a red heat.—Y. E. WHITMORE, *Dental Review*.

A Most Effective Styptic.—The most effective styptic known to the writer for obstinate cases of hemorrhage after the extraction of a tooth or root—i.e. cases that will not respond to the more usual remedies, such as adrenalin—will be found in the formula of Dr. J. P. Buckley, known as phenol-sulfonic acid. A pellet of cotton wet with the acid and inserted into the root socket will cause an almost instantaneous cessation of hemorrhage, without causing any discomfort to the patient, and will be found to be perfectly harmless even if left in the root socket for twenty-four hours.—H. A. CROSS, *Dental Review*.

Gold Inlays.—The gold inlay is, we believe, indicated rather in restoring decayed molars and bicuspid, unless the cavities are small gingival or pit cavities, and in approximal cavities in molars and bicuspid where it would be a long, difficult, trying, tedious operation both for dentist and patient to fill with gold foil, and when amalgam would be a hideous sight; in such cases, surely the gold inlay is indicated. One of the good points in filling such cavities with gold inlays is carving the wax and getting a perfect point of contact. The possibilities of the gold inlay cannot be fully fathomed as yet, for each year its field of influence and usefulness widens; in the hands of the skilled operator we find restoration of cavities more substantial and very much more esthetic.—M. H. DAILEY, *Dental Summary*.

Pyorrhea Alveolaris.—It is the writer's firm conviction that pyorrhea alveolaris is primarily systemic, and in many symptomatic of a uric acid diathesis; and, further, that the most skilful local treatment, unless co-ordinated with alternative systemic treatment, is merely palliative. In making this

positive statement he of course presupposes true pyorrhetic conditions, not acute or chronic gingivitis. We all know that this view is opposed by many eminent practitioners at home and abroad. Current literature on the disease is copious but unconvincing. One searches the maze in vain for a concise, lucid medical paper on its etiology, progress, and radical treatment. The writer has during the past twenty years made exhaustive urine tests in each case treated. Seventy-two per cent. of these tests showed uric acid in abnormal quantities; 8 per cent. earthy phosphates, 3 per cent. albumin, and 2 per cent. sugar. We may therefore reasonably regard the kidneys as causative. Defective osmosis and chronic nephritis may be specified as predisposing causes.—J. STEPHEN SHERRY, *Commonwealth Dental Review*.

To Prevent the Decay of Children's Teeth by Attention to Diet:

(1) Be sure that the child sleeps with the mouth shut and, when awake, breathes through the nose.

(2) From the age of two, let each meal contain some food that needs grinding.

(3) Do not drink until the end of a meal.

(4) Avoid many sweets and sweet biscuits, and only give them as part of a meal. Never give either the last thing at night.

(5) Let the child finish each meal with a piece of fresh fruit or crisp salad.

(6) If fruit is not obtainable, give a stale crust of bread, with butter if preferred, but not with jam.

Unless these rules are strictly adhered to, the child should brush the teeth well after each meal immediately on leaving the table.—A. L. ROWLETT, *British Dental Journal*.

Simple, Accurate Technique for Making Gold Saddles.—Fit 28-gage casting wax to the model with thumb and fingers under warm water, and trim to outline. Now take inlay wax and flow a light rib along the crest of the ridge from one end of the saddle to the other, and one on each side from the crest of the ridge at one end to the margin of the saddle half-way to the other end. These ribs form gates for the gold when casting, and serve as reinforcements to the wax pattern as well as to the finished saddle.

For vulcanite attachment fit a piece of 20-gage clasp wire bent up and down so as to form loops near the margin of the saddle; heat in the flame and stick to place on the wax pattern. By fitting the wax under warm water and chilling with cold air or water, it

can be easily removed without danger of distortion. Attach sprue wire to the end, and flask lengthwise.

A piece of brass or iron tubing of the proper length and size—a tin-can lid with two or three layers of wet blotting paper and a good blowpipe—is all that is necessary for doing the casting.—F. E. ROACH, *Dental Review*.

Zinc Oxid and Oil of Cloves.—It is not likely to be too frequently repeated that a temporary filling of zinc oxid and oil of cloves, placed over softened dentin in a vital tooth, will so dry out the dentin that it can be excavated with comfort to the patient. Such fillings may often remain in place for three months, and will then require a bur or sharp excavator to remove them. The influence of the filling is to reduce the inflammation of the pulp and the sensitiveness of the dentin.

Three months ago an adult case presented in which it seemed probable that the pulp must be removed from two vital teeth. There was no exposure, but the dentin over the area of the pulp was much softened. A temporary filling of oil of cloves and zinc oxid was placed in each tooth, and the patient dismissed. The patient recently returned to the office with the pulps vital, and the teeth in fine condition. The temporary fillings have been removed, the dentin excavated without causing pain, and the teeth filled.

The zinc oxid and oil of cloves should be mixed to a very thick paste, so that when it is patted with a spatula, moisture can just be seen. It should be patted to place in the cavity, and saliva immediately permitted to flow over it.—E. S. ULSAVER, *Dental Digest*.

Directions for Brushing the Teeth:

The brush. Use two brushes, a small brush with fairly stiff and separated bristles for the outside and masticating surfaces of the teeth, and another brush with longer bristles for the inside of the teeth.

How. Brush all the surfaces of the teeth, inside and outside and masticating surfaces, and above all, brush the gums where they join the teeth.

Begin at the gums. Brush downward in the upper jaw and upward in the lower jaw, and use the brush as one would use it to brush the teeth of a comb. It is more important to brush the gums than the teeth. Tenderness or bleeding of the gums is a sign of insufficient brushing.

When. Brush the teeth after every meal if possible, but always after breakfast and

before going to bed. When it is impossible or inconvenient to brush the teeth, eat a piece of fresh fruit or crisp salad after the meal is finished.

Dentifrice. Salt and water is the best to use for the health of gums and teeth, and should always be used at night.

If the teeth stain, a toothpowder or paste may be used once a day.

Use cold water, if possible, and be sure to brush the gums.

Think of what you are doing, and nothing else.—A. L. ROWLETT, *British Dental Journal*.

Indications for the Use of Nitrous Oxid Anesthesia in Extracting.—In the extraction of impacted teeth, especially impacted lower third molars, nitrous oxid is not a suitable anesthetic. This does not apply to unerupted or partially erupted lower third molars giving trouble as a result of irritation through pressure from the opposing teeth. Nitrous oxid is indicated in the extraction of abscessed teeth, and teeth where the gums are sore and infected.

Conduction anesthesia and local anesthesia by cocain or novocain may be used safely where the gum and mucous tissue at the site of injection are in a healthy state. Unfortunately, conditions of this kind requiring extraction are few. It is certainly a most dangerous thing to make an injection of any local anesthetic mixture into gum tissue that is bathed in pus. It is my belief that most cases of blood poisoning following extractions have been due not to the extraction, but to the injection of a local anesthetic mixture into already infected gum tissue. Unfortunately, this has caused the belief among the laity, and some dentists and physicians as well, that a tooth should not be extracted while in a state of abscess. Much suffering has been caused and many cases of bone diseases, such as necrosis and osteomyelitis, as well as diseases of the periosteum, have been caused by this erroneous theory.—VAN BROADUS DALTON, *Dental Summary*.

Process of Bone Repair in Fracture of the Jaws.—The whole process of repair of bone is fundamentally that which takes place in the union of the soft parts. In fractures of the bone we may have primary union, or, we may have secondary union by granulation tissue; this granulation tissue differs from granulation tissue of the soft parts in that it is osseous in character. The injured tissues, infiltrated with blood, soon become invaded by leucocytes and effused blood plasma.

Fibrinous coagulation takes place, and the ends of the fragments are embedded in a dense, ill-defined mass of firm, cellular exudate. The periosteum becomes much thicker, softer, and more vascular; a thin layer of gelatinous or viscid liquid is found between it and the bone for a short distance from the edge of the fracture. In about fourteen days the effused blood is completely absorbed, leaving a firm, dense, cellular, vascularized, partly organized mass of granulation tissue. The bone then undergoes rarefying osteitis, and the fracture becomes fixed. This is known as the "provisional callus."

While this process is going on, similar changes are taking place in the cancellous bone, and the "internal callus" is formed in the same manner. Ossification then takes place, thus completing the process of repair. While the callus is forming, the process of repair is going on in the contiguous soft parts, and they regain their normal condition and function.—CHALMERS J. LYONS, *Dental Summary*.

Advantages of Removable Over Fixed Bridge Work.—When we begin to speak of the advantages of removable bridge work over fixed work, we would be safe in saying that it possesses every advantage, for there is probably no place where fixed work has been placed where removable work could not have been used to better advantage. Even in the case of splints, if made removable, they are preferable to fixed pieces. They need not necessarily be removed by the patient daily, but if for any reason it is desirable to have them out of the way for a time, the dentist can easily remove them. In the case of accident, a removable bridge is easily and quickly repaired in the laboratory without discomfort or pain to the wearer.

When other operations in the mouth are necessary, a fixed bridge is oftentimes in the way, while a removable bridge can be taken from the mouth, leaving ample room for any operation desired, while the rubber dam can be placed over the abutments.

From a hygienic point of view, there can be no question as to which is the best. It is impossible to cleanse and sterilize a bridge which is fixed permanently in the mouth. A removable bridge can be taken from the mouth and sterilized by boiling or any other method that the patient desires. The abutments being simple and symmetrical are then easily accessible, and can be cleansed thoroughly. In addition to the few advantages referred to, the field of possibilities of bridge work is greatly extended, and removable bridges are

indicated where fixed work could not be thought of.

Extension bridges with saddles used to supplement the anchorages are most efficient in removable work, but could not be used at all in fixed work. It can be set down as a fixed rule that supporting saddles should never be used in fixed bridge work. The success of the saddle, especially in extension bridges, depends entirely on the adjustment of the saddle to the ridge. When this is properly done, the work is of the utmost value to the patient, but when not properly adjusted they are an element of weakness, and will have a tendency to loosen the abutments. When the adaptation of the saddle has been properly made, the relation of the saddle, so adjusted, and the

abutment caps, must be taken with plaster with the saddle under pressure, after which the saddle is soldered rigidly to the abutment caps, otherwise the work will be short-lived, and cannot be satisfactory.

The writer does not believe in a movable attachment of the saddles to the abutment caps. An experience of a quarter of a century in doing this special kind of work seems to show that the constant movement of a saddle on a ridge tends not only to loosen the abutments but also to bring about a rapid resorption of the ridge, thus hastening the loosening of the abutment teeth and causing an ever-widening space between the masticating surfaces of the bridge and the occluding teeth.—F. A. PEESO, *Journ. N. D. A.*

OBITUARY

Dr. Thomas G. Aller, Jr.

[SEE FRONTISPIECE.]

DIED, October 29, 1918, at his home in Germantown, Philadelphia, Pa., in his thirty-fourth year, of influenza-pneumonia, THOMAS GUSTINE ALLER, Jr., D.D.S., M.D.

Dr. Aller was born in Brooklyn, N. Y., April 15, 1885, the son of Thomas Gustine Aller and Mary (Platt) Aller. He obtained his early education in the Adelphia Academy and the Polytechnic Institute of Brooklyn, being graduated from the latter institution at the age of seventeen.

He very soon thereafter became interested in the profession of dentistry, and entered the New York College of Dentistry in the year 1903. The next year he entered the University of Pennsylvania and was graduated from the dental department of that institution in 1906. He continued his studies in preparation for his profession in the medical department of the University of Pennsylvania, and received the M.D. degree in 1910. Following his graduation from the medical department, he became resident oral surgeon at Blockley Hospital, where he remained for two years. He then became resident physician at the Episcopal Hospital,

Philadelphia, Pa. In 1915 Dr. Aller began the private practice of oral surgery, and associated himself with Dr. J. D. Thomas, which association continued until the retirement of Dr. Thomas from active practice.

Dr. Aller was for a number of years surgeon of the Second Regiment of Infantry of the National Guard of Pennsylvania, and saw active service with this regiment on the Texas border at the time of the Mexican uprising. He was a member of the "medical unit" from the University of Pennsylvania which went to France in the early stages of the war under the direction of the late Dr. J. William White, and served in the capacity of oral surgeon at the American Ambulance Hospital, Neuilly, France, for several months.

He was a member of the Xi Psi Phi Dental Fraternity, the Academy of Stomatology of Philadelphia, the Pennsylvania State Dental Society, and the National Dental Association.

Dr. Aller was a man of unusual ability as an oral surgeon, with promise of a brilliant future in his profession. His untimely death during the late influenza epidemic came as a severe shock to his many friends. During the epidemic Dr. Aller attended and successfully treated a number of cases of influenza, only to be later stricken down himself. He

was an upright, conscientious, cultured, professional gentleman, one who observed all the finer rules of conduct toward his patients and the profession. In his death the profession loses an intelligent and able oral surgeon, and his family and friends a kind, generous, and lovable companion and friend. His loss will be mourned by a large circle of friends

and acquaintances who honored him for his sterling character and many attractive qualities of heart and mind.

Dr. Aller was married June 1, 1918, to Miss Natalie Walton, Torresdale, Pa., who, with his mother, sister, and brother, survives him. His remains were interred in the Torresdale Cemetery, Saturday, November 2, 1918.

ARMY AND NAVY DENTAL NEWS

The S. A. T. C. and the Army Authorities.

THERE will be considerable trouble encountered by the War department before long, and there may be a congressional investigation and legislation as a result of the protests that are destined to be made by the college authorities on account of the abrupt order to demobilize the students' army training camps. It is pointed out that the administration made known its need for army officers in the late war, and induced the colleges to abandon the traditional standards of collegiate study, and make changes in the structural facilities at the institutions to meet the new requirements, all on the basis of contracts drawn by the War department promising fair compensation to the colleges for all services they were to render in supplying a trained commissioned *personnel* during a period ending June 30, 1919. Accordingly, college presidents and trustees framed their budgets for the year, and made many necessary special expenditures required to fulfil their part of the agreement. It is with this budget upon them and with the S. A. T. C. in the first term of its enrolment that the colleges have been suddenly informed of the collapse of the whole system upon a War department order. To some people the incident takes on the aspect of bad faith on the part of the military authorities. Among those who have taken a lively interest in the subject is ex-President Taft, who will give ardent support to the plea of the colleges for release from the effect of this sudden change in departmental policy. The action in this case Mr. Taft unhesitatingly pronounces as unfair to the colleges, which will be unable to resume their academic courses

and life before next fall, leaving them crippled and struggling for nine months. Mere money compensation will not be adequate, and the continuance of the system is described as an important contribution to the plan for universal military training, besides saving the country from demoralization of its higher educational work.—*Army and Navy Register*.

No Recent Appointments in Medical Corps.

THERE have been no promotions or appointments in the army Medical corps since the armistice was signed, and no policy has yet been adopted affecting future appointments. Until Congress takes some action it is improbable that any officers of the corps now in a temporary status will be transferred to the regular establishment, as it is not known what the strength of the regular corps will be. It may be decided to send inquiries with blanks to be executed, to medical officers in the temporary service, with a view of determining how many desire to be transferred to the regular corps, and who are qualified by reason of age, professional attainments, and their record during the war. Such an inquiry will, however, carry no assurance that any such permanent appointments will be made, at least until further legislation has been enacted fixing the size of the Medical corps.—*Army and Navy Register*.

Relief of Those Recommended for Promotion.

REPRESENTATIVE SNYDER has introduced a Bill (H. R. 13239) for the relief of commissioned officers and non-commissioned men of

the army recommended for promotion, as follows:

"That in cases where a commissioned officer or an enlisted man of the army has been recommended for promotion by his superior or superiors in rank in the service, and has not been so promoted before he shall have been separated from said service, either by resignation or by honorable discharge, the Secretary of War be, and he hereby is, directed, under the regulations now effective, to bestow upon such officer or enlisted man the rank to which the said officer or enlisted man would be entitled were the recommendations of his superior officer or officers accepted and carried out."—*Army and Navy Register*.

Assignments.

Army Dental Corps.

Week ending November 23d.

Maj. Harry M. Deiber to Washington, for duty in office of attending surgeon.

Maj. Wm. A. Squires, Camp Sheridan, Ala., to ninth division as division dental surgeon.

Maj. Samuel Kaufman to Alexandria, La., Camp Beauregard, for duty.

The following to Camp Upton, N. Y., for duty with base hospital No. 136: Majors Peter C. Krupp and Walter H. Richardson.

Week ending November 30th.

Major Earl C. Braniger, Fort Des Moines, Iowa, to duty with base hospital 144.

The following to camps for duty as camp dental surgeons: Majors Eugene Milburn, Camp Cody, N. M.; Harry C. Peavey, Camp Hancock, Ga.; Charles Taintor, Camp Bowie, Tex.; Robert B. Tobias, Camp Greene, N. C.; Lowell B. Wright, Camp Funston, Kan.

Promotions.

Announced November 23d:

To be MAJOR—for existing emergency: Capt. B. Lucien Brun.

Announced December 7th:

To be 1ST LIEUTS. (from November 30, 1918): D. L. England, E. F. Bence, G. D. Lacy, and H. S. Whitney.

Preparedness League of American Dentists.

ORGANIZED UNDER THE AUSPICES OF THE N. D. A.

A Special Post-War Course

WILL BE GIVEN UNDER THE AUSPICES OF THE PREPAREDNESS LEAGUE OF AMERICAN DENTISTS AT COLUMBIA UNIVERSITY DENTAL INFIRMARY, 35 WEST 39TH ST., NEW YORK CITY, JANUARY 20 TO 25, 1919, INCLUSIVE.

The Preparedness League of American Dentists, co-operating with the Department of Advanced Courses in Dentistry of Columbia University, will give a postgraduate course of instruction in oral surgery, physical diagnosis, anesthesia, fractures, splints, and dental prosthesis, at the Columbia University Dental Infirmary, 35 West 39th st., New York City, from Monday January 20th to Saturday January 25th, inclusive.

The fee for the course is \$50. The class will be limited in the interest of efficient instruction.

For detailed information and enrolment address The Preparedness League, care of Columbia University Dental Infirmary, 35 West 39th st.

R. OTTOLENGUI, *Director of Publicity.*

SOCIETY NOTES AND ANNOUNCEMENTS

NOTICES should reach the Office of the DENTAL COSMOS *not later than the 11th or 12th of the month preceding that of publication.*

American Institute of Dental Teachers.

THE next annual meeting of the American Institute of Dental Teachers will be held at Hotel Piedmont, Atlanta, Ga., January 28, 29, and 30, 1919.

Papers on the teaching of war dentistry and an exhibit of war appliances will be the main features, and along with these will be the usual papers on teaching methods. All persons interested are cordially invited.

ABRAM HOFFMAN, *Sec'y*,
381 Linwood ave., Buffalo, N. Y.

Philadelphia Dental College.

ALUMNI SOCIETY.

THE annual meeting of the Alumni Society of the Philadelphia Dental College (Temple University) will be held on Wednesday, April 16, 1919, in the college building, at 18th and Buttonwood sts. All members should be present.

FRANKLIN S. FLUCK.

Dewey School of Orthodontia.

ALUMNI SOCIETY.

THE Alumni Society of the Dewey School of Orthodontia will hold their next annual meeting in St. Louis, Mo., March 6, 7, and 8, 1919. The usual high standard of the meetings of this society will be maintained. All interested in orthodontia are welcome. Address communications to

GEORGE F. BURKE, *Sec'y*,
741-43 David Whitney Bldg., Detroit, Mich.

Minnesota State Dental Association.

THE Minnesota State Dental Association will hold its next annual session at St. Paul, Minn., February 6, 7, and 8, 1919.

A program of unusual interest is being prepared, and a cordial invitation is extended

to all members of the National Dental Association to attend this meeting.

For information address

MAX E. ERNST, *Sec'y*,
1125 Lowry Bldg., St. Paul, Minn.

Missouri State Dental Association.

THE 1919 meeting of the Missouri State Dental Association will be held in the new Hotel Statler, St. Louis, Mo., April 14, 15, and 16, 1919.

A very elaborate program is in preparation, and the St. Louis Dental Society, who will act as hosts, claim that this will be the banner meeting in the state.

H. F. D'OENCH, *President*,
1703 S. Grand ave., St. Louis, Mo.
J. F. WALLACE, *Sec'y*,
Canton, Mo.

Illinois State Dental Society.

THE fifty-fifth annual meeting of the Illinois State Dental Society will be held in Peoria, Ill., May 13, 14, 15, and 16, 1919. The officers of the society are as follows: L. B. Torrence, president, Chester; G. D. Sitherwood, vice-president, Bloomington; J. P. Luthringer, secretary, 507 Jefferson Bldg., Peoria; T. L. Grisamore, treasurer, Chicago; G. H. Henderson, librarian, Chicago.

J. P. LUTHRINGER, *Sec'y*,
Peoria, Ill.

North Carolina Board of Examiners.

THE next meeting of the North Carolina State Board of Dental Examiners will be held at Raleigh, N. C., beginning promptly at 9 o'clock on Thursday morning, January 9, 1919.

For further information and application blanks address

F. L. HUNT, *Sec'y*,
Asheville, N. C.

North Dakota Board of Examiners.

THE next meeting of the North Dakota Board of Dental Examiners will be held in Fargo, January 14, 1919.

For further information write

W. E. HOCKING, *Sec'y*,
Devils Lake, N. D.

Montana Board of Examiners.

OWING to the present war conditions and the lack of a sufficient number of applicants, the Montana Board of Dental Examiners will *not* hold the usual January examinations. The next examinations will be held at Helena, Mont., on July 14, 15, 16, and 17, 1919.

T. M. HAMPTON, *Sec'y*,
Helena, Mont.

Delaware Board of Examiners.

THE next meeting of the Delaware State Board of Dental Examiners will be held on January 15, 1919. Candidates for examination must give written notice of their desire

to take the examination at least two weeks before the date of meeting, accompanied by the examination fee of \$25. The place of meeting will be given upon notice of intention of taking the examination.

W. S. P. COMBS, *Sec'y-Treas.*,
Middletown, Del.

Nevada Board of Examiners.

THE next meeting of the Nevada State Board of Dental Examiners for examination of applicants will be held in Reno, on January 11, 12, and 13, 1919.

W. H. CAVELL, *Sec'y*,
Carson City, Nev.

Idaho Board of Examiners.

THE Idaho State Dental Board will hold its next meeting January 13 to 16, 1919, inclusive, at the Capitol building, Boise, Idaho.

Further information and application blanks can be obtained from

W. A. MYERS, *Sec'y*,
Idaho Bldg., Boise, Idaho.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING OCTOBER 1918.

October 1.

No. 1,280,289, to DAVID PERRY. Dental casting machine.

October 8.

No. 1,280,628 to EDWARD H. ANGLE. Orthodontic appliance.

October 15.

No. 1,281,352, to ALFRED GYSI. Artificial teeth.

No. 1,281,500, to GEORGES A. BROUILLET. Artificial tooth.

No. 1,281,751, to FREDERICK H. APEL. Dentist's bench block.

October 22.

No. 1,282,199, to THOMAS W. DEE. Artificial tooth.

No. 1,282,210, to LUTHER W. FROMM. Mold for artificial repair—teeth.

No. 1,282,446, to THOMAS C. McMAHON and GUSTAV E. FRITZ. Artificial tooth anchor.

October 29.

No. 1,283,189, to EDGAR G. HOUCK. Combined dentist's lamp holder and mirror.

No. 1,283,240, to WILLIAM T. LYON. Dental appliance.

No. 1,283,403, to JOHN P. EUSTIS. Holder for toothbrushes.

THE DENTAL COSMOS

VOL. LXI.

FEBRUARY 1919.

No. 2

ORIGINAL COMMUNICATIONS

Artificial Feeding and Its Bearing on General Disturbances and Malocclusion of the Teeth.

[STUDIES IN ETIOLOGY.]

By MILO HELLMAN, D.D.S., New York, N. Y.

(Read at the annual meeting of the Eastern Association of Graduates of the Angle School of Orthodontia, New York City, May 1918.)

INFLUENCE OF SOCIAL, POLITICAL, AND ECONOMIC CONDITIONS UPON THE ARTIFICIALLY FED.

ONE hundred and twenty thousand children in greater New York are in immediate need of medical attention because of under-nourishment. Two hundred and forty thousand children are on the borderline for careful observation." "*Under-nourishment*, resulting from high food prices brought on by the war, is *already responsible for arrested juvenile development that may become permanent.*" These statements were made on good authority by Dr. Henry Dwight Chapin, specialist in pediatrics, before a medical gathering at the New York Academy of Medicine last winter.

Extensive investigations conducted by Dr. Thiele recently revealed the fact that

Germany is underfeeding her growing youth and her children. They are falling off in weight, and their strength is deteriorating rapidly. As a consequence, there has been an alarming increase in *anemia* and *tuberculosis* among the young. Similar conditions are also prevalent in England, France, Russia, and the rest of the world involved in the present catastrophe that tends to wipe out a considerable portion of mankind. Thus, from general observations it is apparent in what close relationship social, political, and economic conditions stand to the growing and developing human offspring.

PERIODS OF INDEPENDENCE FROM SOCIAL, POLITICAL AND ECONOMIC CONDI- TIONS.

In the life cycle of the individual, independence of these conditions is ex-

perienched during embryonic and fetal development before birth and during infancy after birth. But, as the effects due to the influence of evolution, heredity, and variation have not been clearly distinguished from those of congenital and acquired origin, all speculation relative to malocclusion being brought about

the *only* source of nourishment, the infant will be immune to all hindrances to growth and development that may be brought about during times of social, political, or economic stress and suffering. Thus, nature made a wise provision for the benefit of the perpetuation of the species in the face of all destruc-

FIG. 1.



Female of Medje tribe, N. E. Belgian Congo, with babe, showing enormous development of mammary glands. (By courtesy of Mr. Herbert Lang, Museum of Natural History, New York City.)

by abnormal processes before birth must as yet be regarded as hypothetical.

Regarding the period following birth, more reliable data are procurable from which certain deductions can safely be made. Thus, referring to social, political, and economic conditions, the developing individual will be exempt from their influences in proportion as he will depend upon the mother directly for sustenance; *i. e.*—barring, of course, pathological processes of other origin—as long as normal breast-feeding will constitute

tive emergencies. The extent to which adaptive processes contribute in the perfection of this scheme may be appreciated by a description of conditions observed by Mr. Herbert Lang of the American Museum of Natural History on his expedition in the N. E. Belgian Congo, 1909–15. He observed that owing to the economic conditions prevalent in those regions, the natives of the Medje tribe do not possess sufficient means, and perhaps also not the necessary intelligence, to procure an adequate diet for

the infants and children of the ages at which they are normally weaned among the civilized peoples. As a consequence, weaning is delayed for considerable periods. The mother keeps her child on the breast in certain instances until it is five years of age. The logic is evident. The mother is able to subsist on all foods available, and as long as the secretory function of her mammary glands persists the child thrives splendidly. And that lactation does persist for extensive periods is confirmed by Mr. Lang, and may be evidenced by the wonderful development of the mammary glands in the females of that tribe. It certainly does seem that necessity has produced a remarkable result in the perfection of the milk-secreting organs in the female of that race. Fig. 1 will readily suggest the extent to which such adaptive processes may lead. The significance thereof is paramount in importance if it be realized how nature meets her contingencies. The reverse extreme is quite generally known. No one is unfamiliar with the atrophic appearance of the *mammæ* of the proverbial "spinster maiden," the best examples of which are said to hail from New England.

ARTIFICIAL VS. BREAST-FEEDING.

The more the breast-feeding period is curtailed, the earlier the infant is deprived of its social, political, and economic independence. For it is at once subject to such conditions as earning capacity of parents, market fluctuations of foodstuffs, and social upheavals, such as are produced by wars. These conditions in turn affect the health and growth of the child in proportion as it is dependent upon the foods that are controlled by those potent factors that influence and modify all the destinies of man. This, however, is of secondary importance in the modification of conditions involving the existence of the infant. For, with the adoption of artificial feeding there is a chain of circumstances created that subsequently exerts its influence upon the fate of the newborn in several ways. Thus, regardless

of the economic factor, the infant's health may be impaired by unwise or inexperienced selection of artificial food substitutes, by inexperienced, careless or unintelligent preparation of the same, by the condition of the ingredients utilized in the composition of the food, and by the manner in which it is administered.

According to Holt, gastro-intestinal and nutritional diseases are responsible for 53.5 per cent. of all deaths which occur in infants during the first year. Practically all of these are artificially fed. "In the breast-fed," says Lowenberg,³ "digestive disturbances occur with less frequency and with less severity. They usually are of no consequence, and seldom are associated with nutritional disturbances. Breast milk possesses antirachitic and antiscorbutic properties not found in any other food. In human milk there probably exist certain substances which confer upon the infant a natural immunity against the acute infectious diseases, as these occur with extreme rarity during the first year, especially in the breast-fed. On the other hand, their incidence in this class of patients is marked by less severe symptoms, and recovery is the rule. In the breast-fed, dentition is rarely troublesome. Breast-fed babies gain regularly in weight, sleep well, and are happy. The so-called 'dreaded second summer' does not exist; for the naturally fed infant the danger of milk infection is absent. The food is always practically sterile, of proper temperature, and requires no preparation."

Of course, with the aid of scientific guidance by the modern pediatricist, it is possible to simulate in a large measure nature's methods of nutrition, and thereby reduce the dangers of artificial feeding to its minimum harmfulness. But despite the best obtainable advice of the expert, and despite the most skilful execution of details, there are certain physical, chemical, physiological, and biological difficulties that present insurmountable obstacles in the problem involved in the artificial feeding of infants. Therefore Lowenberg justly contends

that "Physicians have long recognized that the best food for an infant is human milk." But, "In spite of this, thousands of children continue to be placed upon artificial feeding, some to thrive, some to live and to suffer from diseases, and some to die."

THE ESSENTIAL ELEMENTS OF MILK.

The reason for this sentiment is obvious when the number of the artificially fed is compared with that of the breast-fed. Of 268 patients under my care, 217, or 81 per cent., were artificially fed. Furthermore, if a comparison be made of the essential elements constituting the milk of the cow and that of the human being, it will be realized to what extent the physiological requirements of the infant's digestive apparatus must be modified to be adapted to this food.

	Human milk.		Cow's milk.
Protein—Casein	0.6	...	3.25
Lactalbumin	1.4	...	0.75
	—2.0		—4.0
Fat	3.0	...	3.5
Carbohydrates	7.0	...	4.0
	—After CAMERON. ¹		

As shown in the accompanying table, there are some intrinsic differences between cow's milk and human milk. The most striking feature is that the protein of cow's milk is double in amount of that found in human milk, and differs intrinsically in the nature of the curd. The cow's milk clots in lumpy curd, while human milk clots in fine curd. It is this particular feature that prompts Chapin to contend that *intestinal development depends upon the nature of the curd*. "The curd of cow's milk," he says, "is intended to develop the gastro-intestinal tract of a calf into that of a cow, and is therefore suited to the digestion of a calf, while that of human milk is intended to develop the guts of an infant into those of man, and is therefore suited to the digestive powers of early life." It is, therefore, advised that the cow's curd when fed to the infant be given in small amounts at first, and its nature modified by either mechanical or chemical means

until tolerance is established. But whether this tolerance to cow's milk brings about no other unfavorable conditions for growth and development has so far not been ascertained. The fact that various digestive and nutritional disturbances do appear with more frequency and greater severity in the artificially fed infant would point to the probable affirmative of such assumption.

Moreover, since the protein is not the only food element in question in the nutritional problems involved, there are other difficulties to overcome. The fat, for instance, though occurring in the same quantity in both human and cow's milk, is more difficult of digestion by the infant when it originates from the cow. And as a consequence there must be a tolerance established also for this element in the artificially fed. The carbohydrates, on the other hand, are alike chemically in both the human and cow's milk, but differ considerably in quantity. Furthermore, cow's milk is poor in those mineral substances in which human milk is rich. And to this particular quality and to the antibodies derived from the mother, human milk probably owes its antiscorbutic, antirhachitic and immunizing qualities. Therefore, it is necessary to give to the artificially fed, fruit and beef-juice to make up for these deficiencies.

TOLERANCE AND INTOLERANCE OF COW'S MILK.

While a tolerance to the modified cow's milk may be established in the artificially fed by the exertion of care and caution, disturbances of various forms may and do appear in spite of it. That these disturbances may have certain effects upon development and growth depends upon the character of the disturbing elements. Thus, while protein indigestion or intolerance is confined mainly to the intestinal tract, its effects may be of considerably greater consequences. Indigestion or intolerance of fat may cause anemia and poor ossification of the bones (incipient rhachitis). Sugar indigestion or intolerance, on the other hand,

may be, according to Finkelstein,⁴ the cause of intoxication.

To convey a better idea of the nature of these metabolic digressions, it is of advantage to have a little more information regarding their mode of appearance. The disturbances of infantile digestion and metabolism depend upon the functions of the epithelial lining of the alimentary canal. These functions are very complex. It is a well-known fact that the epithelial lining of the alimentary tract secretes important digestive ferments and controls the synthesis of fat and protein; it regulates the passage of water and of salts from the bowel to the blood stream and from the blood to the bowel; it exercises control over the growth and multiplication of the bacteria which reside in the bowel. Alterations, therefore, in the functions of this epithelium must play an important part in the production of disorders of nutrition.

SOME OF THE DISTURBANCES DUE TO ARTIFICIAL FEEDING.

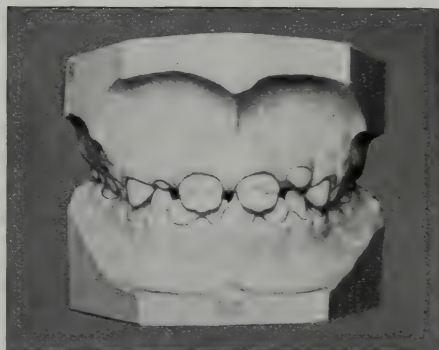
The variety of disorders to which nutritional disturbances give rise is legion; it would consequently be beyond the scope of this paper to attempt anything further than merely an allusion to some of them. Thus, the immediate effect of errors in nutrition or of anomalous conditions in the alimentary tract may manifest itself in diarrhea, constipation, vomiting, scurvy, rhachitis, infantile atrophy or marasmus, spasmodophilia, etc., with considerable variations and numerous complications. If, however, their pathogenesis, etiology, and symptoms be analyzed, it is quite plain that an intimate relationship exists between these disturbances and bottle-feeding. However, what is of paramount interest in connection with our topic is not only the manner in which these perversions in nutrition or digestion occur, or the form they assume in the various instances, but rather the subsequent effects produced through their influence in the growing and developing individual. For this purpose it will be necessary

to touch upon only few phenomena in order to demonstrate that certain nutritional disturbances, though prevalent at an early period in the history of the development of the individual, leave, nevertheless, indelible marks in the form of dysontogenetic results or malformations that persist for a long period—if not, indeed, for life. Prominent among these may be named *rhachitis*, *spasmodophilia*, and *exudative diathesis*.

RHACHITIS.

Rhachitis is a general disease occurring as the result of perverted metab-

FIG. 2.



Casts of the denture of a boy of eight years, showing the effects of rhachitis upon the enamel formation of the incisors. Similar conditions are also prevalent in the first permanent molars.

olism. It is known mostly by its clinical manifestations, *i. e.* by changes in the osseous, muscular, nervous, and digestive systems. It is not intended to go into any detail regarding the disturbance itself, but rather to bring it to your notice in connection with several points of interest, *viz*: Because its etiology is closely associated with the artificially fed; because the lesions characteristic of this disease are found in the osseous tissues, with which the orthodontist is largely concerned; because the deformities produced may persist long after the disappearance of the disease, and because certain features belonging

to this disturbance may be observed throughout life. The shape of the flat bones, as the peculiarly shaped head, the curves of the long bones, as in bow-legs, the angles of the joints, as in genu valgus and varus and pes valgus and varus; certain manifestations in the structure of the permanent teeth, as in Fig. 2, and prolonged retention of the deciduous teeth, constitute the footprints left by this disturbance.

A striking peculiarity of this disease is that in a large number of cases it is present in an incipient stage only, and proceeds to a spontaneous arrest before the various diagnostic features are manifested. It is obvious, then, that under such conditions the patient or family remains ignorant of what had transpired and are ready to deny any reference thereto.

A more detailed description pertaining to the condition of the osseous tissue in this disease, and its bearing on orthodontia, will be made in a subsequent contribution, when particular stress will be laid on general ossification processes in the skeletal system. Suffice it at present to emphasize the facts that owing to the close relationship of rhachitis to the artificially fed, and to the prevalence of such manifestations as are presented by changes in the shape of bones, in the angles of joints, and in the dental structure and attachment, it becomes a matter of considerable interest to the orthodontist from the aspect of its diagnostic importance or prognostic significance. For the degree of success attainable by means of orthodontic treatment in cases presenting the effects of this disturbance may be largely gaged by the extent of its ravages.

SPASMOPHILIA; TETANY.

Spasmophilia, or *spasmophilic diathesis*, is a condition characterized by an increased electric irritability and a tendency to spasm-like contractions of one or more groups of muscles.

There are two points of interest in connection with this diathesis. One is that it is rarely if ever manifested in

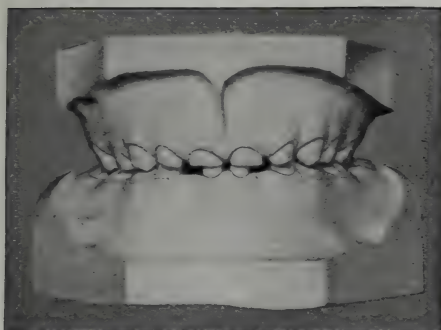
the breast-fed. Thus, in institutions where large numbers of infants are reared, it has been found that more than fifty per cent. of the artificially fed show evidences of this diathesis. Furthermore the symptoms are unknown in breast-fed infants and in the artificially fed they rapidly improve when returned to the breast.

The other point of interest is that it stands in close association with disturbances in calcium metabolism. Owing to this fact, and to the fact that spasmophilia and "rickets" frequently occur in the same subject, the one or the other group of symptoms is prominent in many other cases. The connection between the two disorders is due to a *common etiology—that of a deficiency of calcium salts in the body. In rhachitis, however, the loss falls upon the bones; while in spasmophilia the symptoms are due to a depletion of the nervous tissues.* As the causes of the calcium metabolic disturbances have frequently been attributed to changes in the parathyroids and as the parathyroids have been experimentally demonstrated by Erdheim,¹⁰ Fleischman,¹¹ and Kranz⁹ to affect the calcification of the enamel of the teeth, it becomes a most interesting problem for orthodontists and dentists to corroborate the diagnosis by such manifestations. It would be of considerable value to the science of medicine to obtain such data as can be furnished by the orthodontists and dentists. This can readily be accomplished, if sufficient attention be given to gather correct information regarding the history of the patient in correlation to the various forms of abnormal depositions of the enamel covering of the crowns of the teeth.

In a previous contribution,⁸ it was pointed out that, of 149 cases examined, 83 per cent. of which were bottle-fed, it was found that 45 per cent. showed enamel abnormalities. These abnormalities in many instances simulated similar defects in the enamel of the teeth of lower animals upon whom parathyroid experiments were performed, and also resembled those demarcations of the teeth of individuals whose thyroid mechanism is

involved. It is therefore quite probable that an interrelationship between spasmodic disturbances and the parathyroid disturbances may exist, and if it does, the dental

FIG. 3.



Casts of the denture of a girl of seven years, showing the extremely reduced size of the central incisors and missing of lower laterals. This patient had symptoms of spasmophilia in infancy.

symptoms would be of paramount diagnostic value.

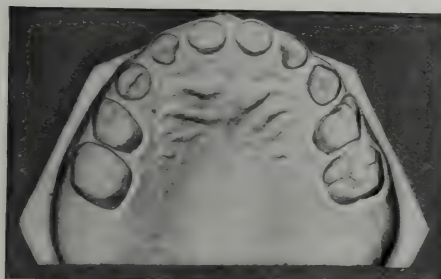
Figs. 3 and 4, A and B, illustrate a case of this description. Age of patient, seven years, height 46 in., weight 51 lb.

had to be assisted, on account of spasmodic disturbances, by lancing of the gums, and when erupted, though normal in form, they were poorly calcified; some were small in size (the incisors) and others were congenitally missing (the lower lateral incisors). (Fig. 4, B.) The excessive wear may readily be seen in the illustrations. The child was until recently poorly nourished, anemic, under-developed, and very nervous.

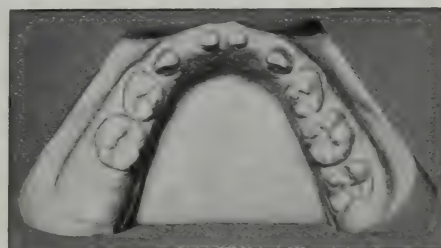
EXUDATIVE DIATHESIS.

Among the many disturbances of infancy that baffle the pediatricist, the condition known as "exudative diathesis" is the most prominent. To Czerny belongs the credit of having crystallized under this term—representing a disturbance in metabolism—an ensemble of clinical phenomena occurring with frequency in infants and children. Although it is at present known that these manifestations are limited to infancy and childhood, it is questionable whether so important a factor in the health of a child may not in some way leave effects persisting even in adult age. As will be shown later, some evidence exists tending to the inference that such is the case.

FIG. 4.



A



B

Occlusal view of the casts in Fig. 3, showing extensive wear of the central incisors due mainly to poor calcification.

The history discloses that parturition was instrumental, lactation for three months, with the result of under-nourishment; bottle-feeding for an extensive period. The eruption of all the deciduous teeth

This diathesis affects alike both the breast-fed as well as the artificially fed. The breast-fed with an abundance of milk at its disposal will at times appear no better nourished than the poorly fed

bottle baby. Most of the authorities agree that the exudative diathesis is a congenital anomaly of the organism, and "usually affects all members of a family."² Hoobler,⁵ nevertheless, asserts that a suppressed anaphylaxis from the protein of cow's milk will bring about a group of symptoms which correspond to those of the exudative diathesis. The condition is characterized by the frequent occurrence of fibrinous or exudative inflammatory processes which attack principally the skin and mucous membranes. The processes appear as eczema and as catarrhal involvement of the respiratory and gastro-intestinal tracts; the lymphoid tissues may exhibit chronic enlargement, and the nervous system may be disturbed. To elucidate, it must be explained that infections may occur in two ways: There may be an *enteral* infection or a *parenteral* infection. In the former the infective agent gains access through the intestines, and may produce such disturbances as amoebic dysentery or typhoid fever, while in the latter the avenues of infections are other than the intestinal tract; it may be through the skin as in eczema, the respiratory tract as in laryngitis, bronchitis, etc. It is largely through parenteral infections that the exudative diathesis becomes manifest; that is, it constitutes a predisposing factor.

The exciting causes are variously attributed to a disturbance in fat metabolism (Czerny) or an error with the water and the salts (Finkelstein). Also a disturbance in the nitrogen metabolism is suggested by Finkelstein. "In any event," says Lowenberg, "it may be stated that somewhere in a perverted metabolism lies the cause, and somewhere in diet the cure, because all cases are decidedly benefited by changes in the food and in the external surroundings."

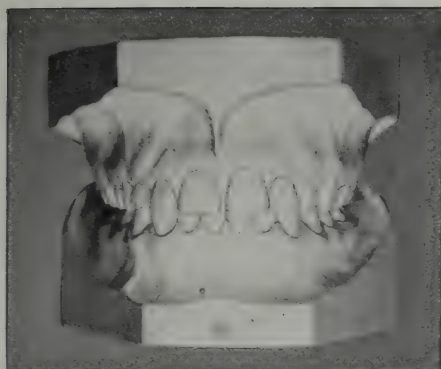
The effect of this disturbance is variously diagnosed by (1) body weight, (2) skin manifestations, (3) respiratory phenomena, and (4) digestive symptoms. The occurrence of substitution phenomena is a part of the natural clinical picture of disease. Thus the skin symp-

toms may entirely disappear, to be followed by an attack of asthma or digestive disturbances, and these in their turn will be succeeded by an attack of eczema.

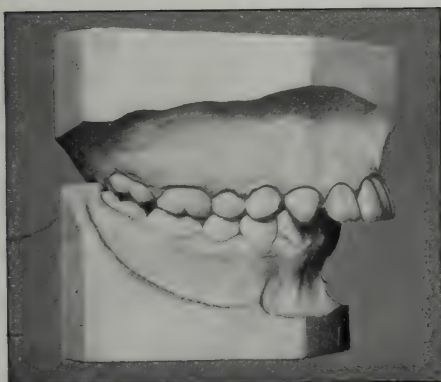
It may be stated at this point that, in orthodontic practice, one is too prone to consider the cure of the anomalous manifestation without much thought of the stages preceding its development. It is consequently quite natural that the curative and not the causative factors should be so pre-eminently to the fore when discussions pertaining to success or failures accompanying orthodontic endeavors arise. Considerable censure is, therefore, usually made pertaining to the mechanical skill, the kind of appliance employed, and the technique of the operator, upon failure to attain the ideal in orthodontia, or *vice versa* in cases of success. While criticism is always an incentive to better efforts, it must be impartial to be constructive. Thus, it would be just, if besides appliance, skill, technique, etc., we include also the nature of the case in question in its correlation to the general condition of the patient. Every orthodontist has undoubtedly treated more than one case of a certain type by means of the same kind of appliance. Has he, under those conditions, *always* obtained like results? And have the results always improved proportionately with his skill? To the careful observer it has been evident that, given the same type of appliance, the same operator, the same type of malocclusion, and the same amount of skill, we shall obtain results which will differ in kind in each individual case to a marked degree. Why? Because each case presenting for treatment is not a *normal* deviation from a certain standard, but rather a *pathological disturbance*, the *exact nature of which has as yet not been ascertained*.

Figs. 5 and 6, A, B, and C, present two cases of the same type of malocclusion, namely, class II, division 1 (Angle). Both were treated in a like manner, with the same desire and aim in view, namely, to obtain the best results. In the one instance, Fig. 7, A, B, and C, representing the conclusion of treatment

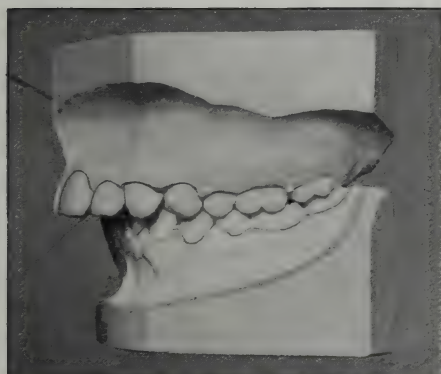
FIG. 5.



A



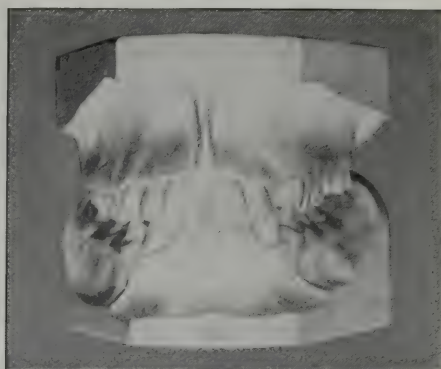
B



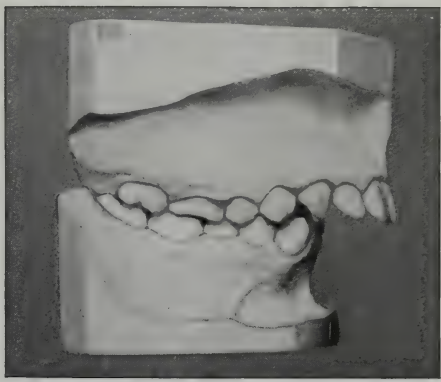
C

Casts of denture of a comparatively robust patient, showing a morphologic similarity to case in Fig. 6, though differing extremely in various constitutional respects.

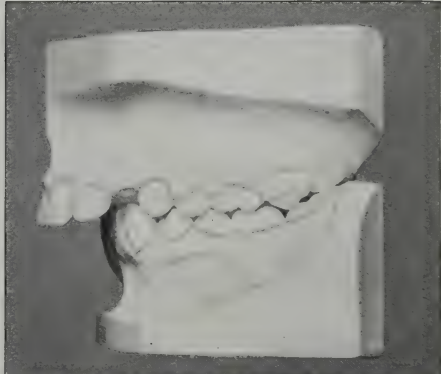
FIG. 6.



A



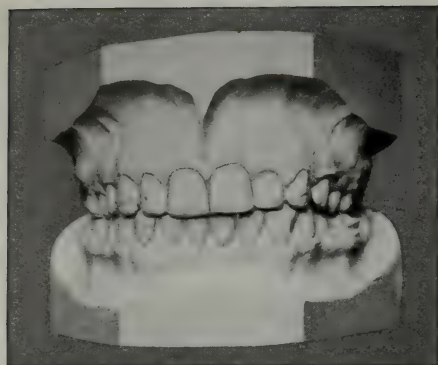
B



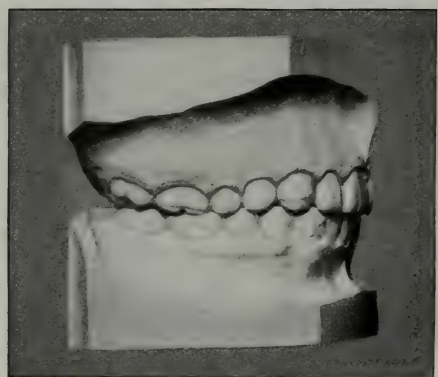
C

Casts of denture of a delicate and anemic patient, showing considerable resemblance to case in Fig. 5.

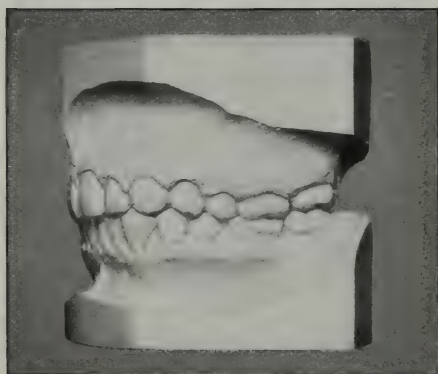
FIG. 7.



A



B



C

Casts of denture of the case in Fig. 5, showing successful result at termination of treatment.

of the case in Fig. 5—the success may be evident. It was obtained in a comparatively short time with little difficulty. In the other case, Fig. 6, the progress is so slow that, judging from past experience, the end is rather far distant as yet, although the treatment was begun a year earlier and is being continued a year after the other case was dismissed.

Upon resorting to the histories, it may be found that in the case presented in Figs. 5 and 7 the child was breast-fed and has always been robust and well, and though she had a slight attack of pertussis and measles in childhood, her health was never seriously impaired. Tonsils and adenoids were removed on account of catarrhal affections and she was addicted to thumb-sucking.

The history of the case presented in Fig. 6 reveals the fact that from birth on she was brought up on the bottle. She has always been a delicate child, and suffered severely from whooping-cough when two years of age and from the exanthemata thereafter. She also sucked her thumb, but changed off, using all sorts of pacifiers. Tonsils and adenoids were removed when six years of age. At present she is pale, thin, and subject to various kinds of disturbances. According to an X-ray examination, the calcification of the long bones is found to be considerably slow.

If in the so-called "study of cases"* a complete record of the history of the patient as correlated with the malocclusal manifestation be obtained, a clue to unsuccessful orthodontic endeavors may be obtained, and the cause of them more satisfactorily explained. For instance, it is at present rather difficult to explain why upon the successful completion of a case of malocclusion—including careful and efficient retention for extensive periods—*there still persists a tendency to relapse* for an indefinite length of time after the appliances are removed.

* A favorite phrase employed in orthodontia implying an examination of casts of a mouth for the purpose of deciding upon the kind of appliance to be constructed and the manner of its adjustment and manipulation.

It is equally as difficult to explain why the progress made in some cases is so exasperatingly slow as to test the patience of a saint, while, upon their completion, the rapidity with which a relapse may occur is so great as to surpass the wildest of dreams. It is also no easy task to explain why in some instances the teeth will assume positions or move in directions contrary to expectation. Beyond the kind of appliance used and lack of skill of the operator, pernicious habits, carelessness, negligence, and indifference of the patient, no reasonable cause can be found.

Upon careful deliberation, it may, however, be realized that in the establishment of a case of malocclusion a long period of time has to elapse. Its visual development may be traced to the beginning of the functioning period of the mouth, and reaches the final stages when brought to our notice. It consequently follows that considering the length of time consumed in its evolution, so to speak, as compared with that consumed in the development of the individual, it cannot be denied that there is a direct relationship between the two phenomena. Furthermore, if the developing individual is subject to the disturbances pointed out above, and may be influenced by the effects of the various disease processes, may it not also be possible and perhaps probable that the occlusion is also subject to the influences of the same cause? That is, can there be no probability that malocclusion of the teeth may stand in some sort of correlation to certain disease processes, and that both may be the result of a common cause?

Reverting to the diagnostic features of the exudative diathesis, it will be surprising to note the large number of cases coming under the care of the orthodontist that could be grouped under this heading by the diagnostic manifestations peculiar to this disturbance. Thus, no orthodontist having a moderate number of children under his care is unfamiliar with the appearance of the puny, pale, delicate and underfed individual, despite

the best care and environment. And *vice versa*, the robust, overfed, fat, and apparently healthy looking individuals have also come under his observation, and he was amazed at the suddenness with which they succumb to disease. He will also not fail to notice the skin manifestations in the form of eczema of the face and head, exanthemata, rashes, persistent cracks in the lips or in the skin at the corners of the mouth (a sort of intertrigo) which is so annoying to both the patient and operator. The respiratory symptoms, such as enlargements of the lymphoid tissue in the naso-pharynx and the tonsils, are so popular in orthodontia as to be blamed by some authorities for all forms of malocclusion. And the digestive symptoms are not to be overlooked as they appear with persistent frequency in such forms as canker sores, stomatitis, strophulus, *fætor ex ore*, etc.

Regarding the suddenness with which these patients succumb to disease, a description of the following two cases may be illustrative. One patient, a boy, fifteen years of age, about six feet in height and of proportionate weight, was brought up under the most favorable conditions and looked the picture of health. On several occasions he visited my office after coming in from the country, where he attended school, and upon reaching home he experienced a pyrexial disturbance sending his temperature up to about 103° or 104° F. He would then be laid up at home for several days, and thereafter be entirely well for an extended period. On one occasion he was referred to a dentist for the restoration of a missing tooth by means of bridge work; upon hearing the dentist's explanation of the necessity of devitalizing a tooth, he immediately felt ill, and when reaching home was confined to the bed for several days with high fever.

Another boy in my practice I can never make a definite appointment with, for similar reasons. This patient is also troubled with asthmatic attacks, and when an appointment is given it is always provisional, *i.e.* it depends on the condition of the weather, or the rise in

his temperature. And yet he looks perfectly well, has good color, and is of normal stature and weight.

In an effort to determine the frequency of the various disturbances appearing in individuals presenting malocclusion of the teeth, the histories of 215 cases were tabulated, the results obtained being as follows:

Tonsillar affections	121
Adenoid "	107
Measles	95
Chicken-pox (varicella)	81
Whooping-cough (pertussis)	85
Scarlet fever	21
Chorea and other nervous disturbances	17
Typhoid fever	4
Dysentery and other intestinal disturbances	19
Mumps	16
Adenitis	9
Eczema	6
Diphtheria	8
Rheumatism	5
Mastoiditis	6

—and a number of other diseases of less frequency.

On grouping these diseases in the various cases, it was found that—

Of 95 cases who went through an affliction of measles, 75 also had tonsillar and adenoid disturbances;

Of 85 who had pertussis (whooping-cough), 58 had tonsillar and adenoid disturbances;

Of 81 who had varicella (chicken-pox), 51 had tonsillar and adenoid disturbances; and

Of 21 who had scarlet fever, 18 had tonsillar and adenoid trouble.

Furthermore, of those who had two or more of the above diseases complicated by adenoid and tonsillar affections, there were 83.

Considering, therefore, that as in the exudative diathesis there are involvements in the form of affections of the skin, mucous membranes of the digestive and respiratory tracts, of adenoid and nervous tissues, it is quite probable that some, if not many, of these individuals had at some time in the course of their development exhibited symptoms very

much akin to those of the exudative diathesis. And although they have come through apparently unscathed, they are by no means normal in their constitutional organization. For these afflictions and their possible influence may have produced such alteration and modification of the various tissues of the entire economy as to render it difficult to assume that the anatomical parts involved in orthodontic treatment remain unchanged, and should, with the exception of the occlusion of the teeth, be considered as normal. Furthermore, judging from the complication of occlusal anomalies by the anatomical and morphological manifestations of the teeth themselves, the character of their attachments, and the appearance of the gums, it may be realized that some of these conditions are far more remote from the normal than is realized. It may, therefore, be reasonable to assume that persistent relapses, after careful active treatment, and extensive periods of retention, may be referable to such morphological changes in the tissues involved as to be irremediable by mechanical means alone.

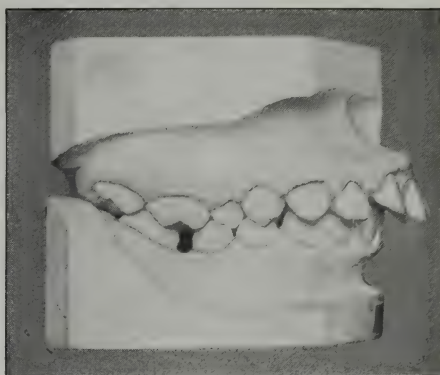
On the other hand, it may be advisable—in some cases, at least—to attempt no orthodontic procedure at all when general conditions do not promise a successful issue. Fig. 8, A, B, C, D, and E, presents a case of considerable interest in this relationship. The patient, a female, was eleven years of age. Note the hypertrophied condition of the gums. The bone supporting the teeth was poorly calcified, as shown in the X-ray, Fig. 9, A and B. The history reveals that she was bottle-fed for three years; always used a pacifier; adenoids and tonsils were affected, and had to be removed; she had measles four times, also mumps, chicken-pox and typhoid fever.

Contrary to indications, orthodontic treatment was undertaken, with disastrous results. The bone constituting the alveolar sockets actually dissolved away from the effects of the pressure exerted upon the teeth, and tooth after tooth was lost. See Fig. 9, A and B, showing the

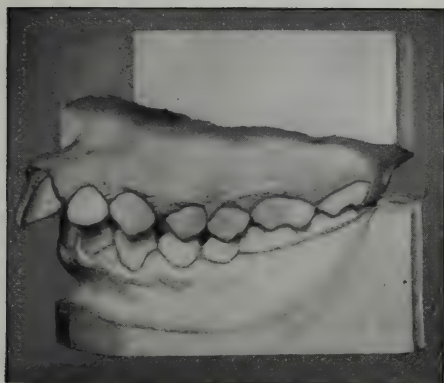
FIG. 8.



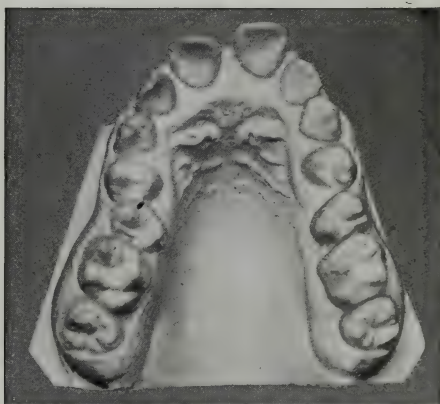
A



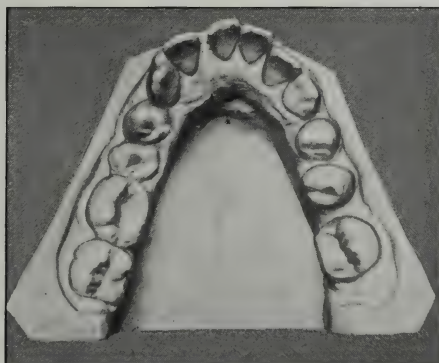
B



C



D



E

Casts of denture of a patient whose case should not have been treated.

resorption of the alveolar sockets around the lower left central incisor (A), and the absence of the upper right central incisor (B). Treatment had to be discontinued.

In view of the fact that in orthodontia prognostic utterances are invariably made from a basis of anticipation instead of from that of deduction, it seems inevitable to escape the assumption that a gross error has as yet to be overcome in the procedure preceding treatment. In other words, since the prognosis in all cases of malocclusion is the same—

brought forth by focusing the attention upon the following facts:

(1) That malocclusion of the teeth is neither a normal manifestation nor a normal variation, but rather a deviation from the normal to such an extent as to belong to the domain of pathology.

(2) That pathological conditions can be recognized by their diagnostic manifestations alone, and these will be of significance only as they may link the symptoms with their causes.

(3) That malocclusion of the teeth has been found to occur most frequently

FIG. 9.



Radiographs of the incisor region of the case presented in Fig. 8, showing loss of upper incisor (B), poor bony structure in general, and intense resorption around the lower incisor (A).

namely, *restoration of "normal occlusion"*—it follows that the necessity of ascertaining the various diagnostic manifestations associated with the diverse cases presenting anomalous conditions is of no practical importance. Or, conversely, if "*normal occlusion*" is the *stereotyped promise*, in every case of malocclusion, may it not be regarded as a preconceived prognosis regardless of the character, the kind, and the degree of the anomalous condition? Or, may it not be assumed that it is an inevitable prognosis, and that it can be made even without an examination of the case?

CONCLUSIONS.

It is therefore necessary to emphasize the object and aim of what has been

in those individuals who were artificially fed (bottle-fed) in infancy. Of 268 patients presenting occlusal anomalies, 217 (equal to 81 per cent.) were bottle-fed, or breast- and bottle-fed.

(4) That malocclusion of the teeth has also been found to stand in close relationship with many general disturbances caused by artificial feeding.

(5) That the health of the artificially fed is subject—apart from various disease processes—to political, social, and economic circumstances.

(6) That of 215 cases of malocclusion examined, the fact was revealed that besides various other manifestations, symptoms were observed which are very much akin to those prevalent in rachitis, spasmophilia, and the *exudative diathesis*. It is therefore probable that the

symptomatic factors of these disturbances found in conjunction with occlusal anomalies are but surviving manifestations of a common cause.

(7) That the prognosis concerning pathological conditions, including malocclusion of the teeth, must be made from deductions based upon the evidence borne by the causative factors and diagnostic manifestations.

(8) The suggestion may, therefore, be advanced that in order to promote the progress of our specialty, more definite knowledge pertaining to the etiology of malocclusion is an urgent necessity. This knowledge may be gathered from the diagnosis of our cases provided it includes not only a record of the form of the dental arch and the position of the teeth and jaws, but also the various general disturbances which the individual has passed through before presenting for treatment—for general disturbances may in many instances not only be the means of yielding a clue to the solution of many a baffling problem, but may also serve as powerful indicators pointing to the origin of prevailing conditions.

BIBLIOGRAPHY.

- (1) CAMERON, HECTOR CHAS. "Diet and Disease in Infancy," 1915.
 - (2) GRULEE, CLIFFORD G. "Infant Feeding," 1917.
 - (3) LOWENBERG, HARRY. "Infant Feeding and Allied Topics," 1916.
 - (4) FINKELSTEIN, HEINRICH. "Lehrbuch der Säuglingskrankheiten," 1911.
 - (5) HOOBLER. *Amer. Journ. Dis. of Children*, 1916, xii, 129.
 - (6) LANGSTEIN u. MEYER. "Säuglingsernährung und Säuglingsstoffwechsel."
 - (7) HELLMAN, MILO. "A Study of Some Etiological Factors of Malocclusion," *DENTAL COSMOS*, September 1914.
 - (8) *Idem*. "A Further Study of Some Etiological Factors of Malocclusion," *DENTAL COSMOS*, February 1916.
 - (9) KRANZ. "Innere Secretion," etc., *Deutsche Zahnheilkunde*, etc., 1914.
 - (10) ERDHEIM. Quoted after Biedl, "Innere Secretion."
 - (11) FLEISCHMAN. Quoted after Biedl, "Innere Secretion."
- 40 E. 41ST ST.

[See also *Discussion*, as reported under "Proceedings of Societies," this issue.]

Report of an Unusual Case of Third Molar Impaction with Complications.

By W. L. SCHREIBER, M.D., D.D.S., Philadelphia, Pa.

AS part of our clinical work in connection with the third session of the Plastic and Oral Surgery course given to the army surgeons and dentists under the auspices of the Evans Institute, we had the pleasure of operating before the members of the class in the Polyclinic Hospital, Philadelphia, upon the case herein recorded. The word "pleasure" is used, first, because one phase of the case, viz, the inverted im-

pacted wisdom tooth, while not unique, is rare, and secondly, because of the happy result (to the patient) attained.

HISTORY.

L. R., female, white, age twenty-seven. Six years previous to the time of operation upon the impacted tooth the patient developed an acute suppurative otitis media on the right side, which condi-

tion may or may not have been due to the unsuspected tooth condition, though much the same process, we observe, occurs in the case of teething children.

After evacuation of the pus from the middle ear by paracentesis of the tympanic membrane, as performed by Dr. T. J. Byrne of this city, the operation—which, by the way, had to be accomplished under the difficulty occasioned by a very decided congenital atresia of the external auditory canal—brought the immediate relief hoped for, but unfortunately the relief was not permanent. Pain of a neuralgic type had been present practically constantly for a period of six years, radiating over the mandibular, maxillary, and temporal regions of the right side, and eventually affecting the vision, causing intermittent amblyopia.

Two and one-half years previous to our operation, according to the patient's account, a very large abscess developed in the roof of her mouth on the right side in the molar region, for the relief of which she had a perfectly sound second molar removed. The operation did not accomplish the result desired. The abscess persisting was opened the following day by the dentist who had performed the extraction, but the pain was not relieved despite the apparent subsidence of the abscess condition. The patient then consulted another dentist who immediately extracted the remaining molar and second bicuspid, which the patient believes were healthy teeth. This patient, I might state in passing, maintains an excellent oral toilet. Following this the pain not only persisted but became gradually intensified, which caused her to seek further advice from her physician, with the result that she was referred to me.

Before going into a discussion of the operative procedure, let me ask that three factors be borne in mind: *First*: The ear condition. *Second*: The palatal abscess. *Third*: The pain. All of these conditions were confined to the right side, as were the other concomitants which we shall hereinafter point out.

DIAGNOSIS.

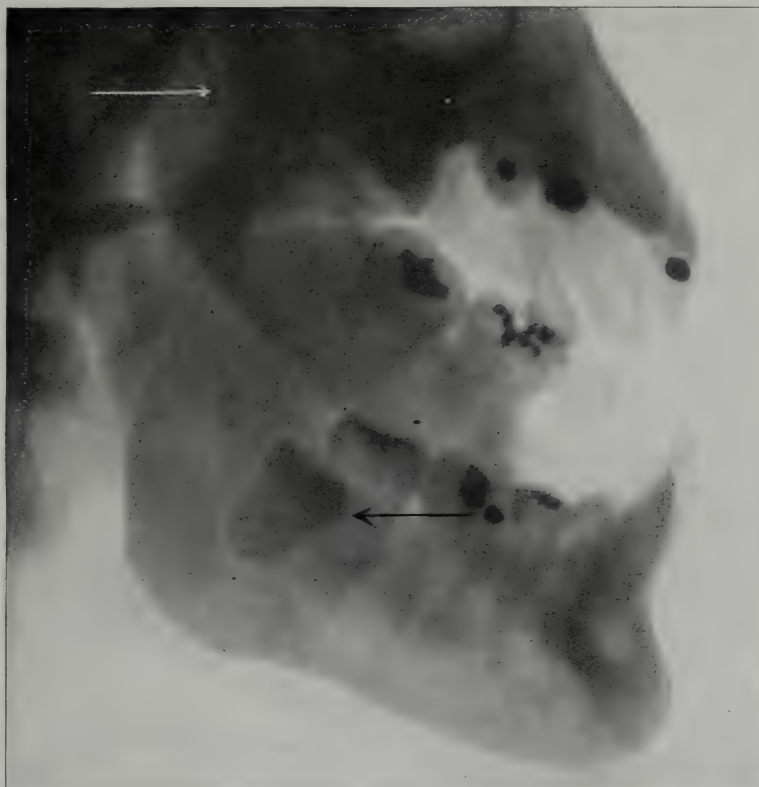
After securing the above history from the patient, a general oral examination was made which revealed a most healthy state of the hard and soft tissues.

Then we noted the dental formulae, thereby learning that the entire mandibular complement was present with the exception of the third molar, which, according to the statement of the patient, had not been removed. The dental members of the right maxilla were absent posterior to the first bicuspid. Inquiry as to whether in the patient's knowledge either of the maxillary molars which had been extracted at the time when the palatal abscess heretofore mentioned prevailed was a third molar, did not elicit information of a nature to guide us in our diagnosis, she stating that during a consultation between the dentists who performed the extractions at that time this fact was not determined.

Consideration of the history and dental findings led us to suspect the presence of an impacted third molar, verification of which was brought about through resort to the X-ray. The first negative showed the right mandibular third molar to be impacted and diverted to the buccal side of the second molar. (Fig. 1.) Intimate study of the right maxillary third molar region in this same negative led us to believe in the possible presence of an impaction of the upper right third molar, as portrayed by a dark area (Fig. 1), with the tooth in a supposedly normal position as pertains to correct cuspal eruption, although we were not counting definitely upon this, because in this exposure the rays were focused upon the mandibular region and not upon the maxillary, thus producing distortion and blur of objects outside the range of focus. A film negative was next made of the molar region, which brought to light the root as shown in Fig. 2. Complete union of the gum tissue was established over this root, after extraction of the molar of which it had been a component. The presence of the root was entirely unsuspected; in fact,

had it not been that we secured the film in a poor picture. It will be seen that negative with the intention of proving the dark area in Fig. 1 has a conical

FIG. 1.



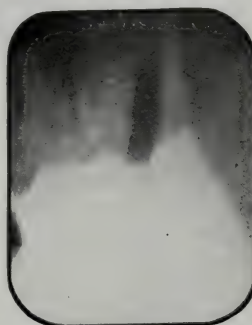
the probability of an impacted maxillary third molar and its position, the root most likely would still be holding forth in its sequestered nook. One of the vagaries or shortcomings of the X-ray is nicely exemplified here, in that, while this root was not visualized on the plates, it was quite plainly shown on the film, our discovery being attributable to good fortune.

Confirmation of our tentative maxillary third molar impaction diagnosis is portrayed in Fig. 3, with the further enlightenment of its inversion.

Comparative study of the dark area in Fig. 1 with the true condition as shown in Fig. 3 will make it clear how a mistaken reading as to relative cusp and root position might easily be made

shape with the base toward the alveolar cervical border, apparently correspond-

FIG. 2.



ing to the crown, while the upper or apical part of the cone would seem to

indicate the position of the roots. This reading is, of course, disproved in Fig. 3.

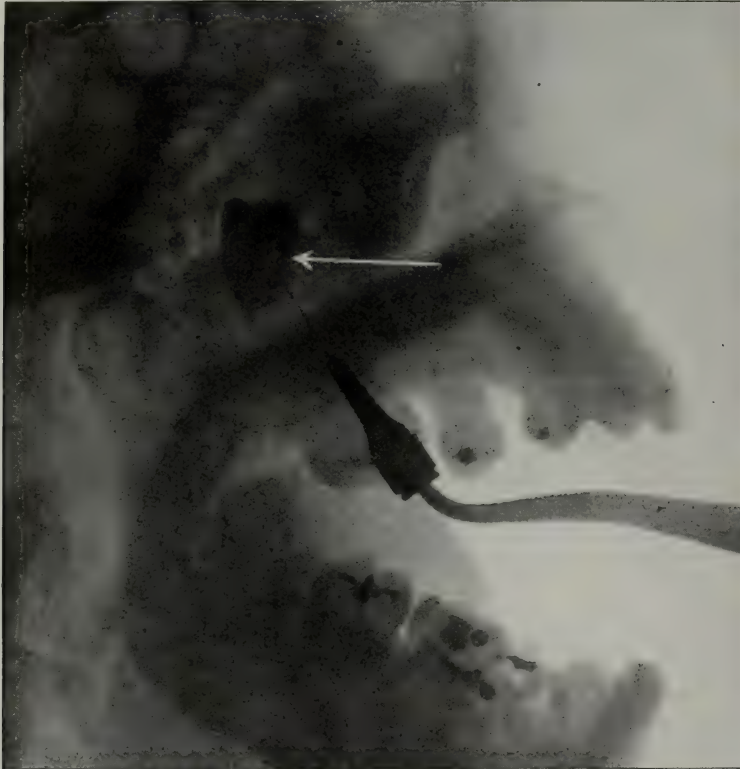
In the absence of the usual guiding landmarks (the molar teeth *in situ*), we were more or less at a loss to determine the exact location of the impacted tooth, therefore we resorted to the expedient to be seen in Fig. 3. The shank or threaded part of a hypodermic needle

two: First, we supplied a landmark in a field otherwise denuded from a dental standpoint; second, we established a scar on the soft tissue to guide us in our future operative calculations.

OPERATIVE PROCEDURE.

Let us now consider the case from the surgical aspect. Needless to state,

FIG. 3.



point was packed with wax and the points of an ordinary dental dressing pliers inserted therein. The cheek was retracted forcibly backward and upward and the needle point made to penetrate the soft tissues at a point in the dome of the buccal sulcus directly over the distal aspect of the tuberosity, the exposure being made while held in this position, as shown in Fig. 3. Our motives in following this procedure were

the entire operation was accomplished intra-orally, and yet some general surgeons are still removing impacted teeth through extra-oral or skin incisions, which is entirely uncalled for. Ether was the anesthetic agent used.

We first attacked the root of the second molar, which, as stated above, had been left behind from a previous attempt at extraction and had become absolutely covered by gum tissue to the

thickness of more than a quarter of an inch. An incision 1 cm. in length was made along the crest of the alveolar ridge down to the periosteum, the central point of this incision corresponding approximately to what we calculated to be the position of the embedded root after having made a measurement on our film from the distal surface of the first bicuspid backward to our objective. To permit sufficient leeway a transverse incision about 1 cm. in length was made at each end of the ridge incision, thus outlining two flaps, each 1 cm. long by $\frac{1}{2}$ cm. in width, which were retracted from the periosteum, exposing the jagged end of the root, which was extracted with a small-beaked root forceps.

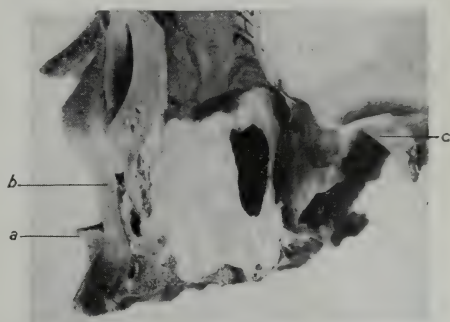
Attention was next directed to the impacted maxillary third molar. The incision in this step was made along or in the dome of the buccal sulcus, down to the bone, an assistant meanwhile keeping the cheek retracted as far backward and upward as possible, the knife being driven backward until its excursion was halted by contact with the external surface of the external plate of the pterygoid process of the sphenoid, then carrying it forward along the dome as far as the canine, the resultant scar persisting in the same manner at the present writing.

The soft tissues were retracted upward from the bone as high as the sphenomaxillary fissure, posterior to the malar process of the maxilla, and upward almost to a level with the infra-orbital foramen anterior to this bony projection, thereby exposing practically two-thirds of the external right maxillary surface. Further dissection posteriorly by means of the finger brought to light the tendon and considerable of the muscular body of the external pterygoid. A fairly open field for operation was thus uncovered, nevertheless constant retraction needs to be employed to prevent the fatty and other tissues of the cheek from falling back into place and obscuring the field of vision. At this stage, close scrutiny of the bony area which was thought to lie superjacent to the tooth failed to dis-

cover the least dehiscence through which some part of the tooth might project or be seen—that is to say, the osseous envelope was complete over the tooth in question.

Had it not been for the excellent X-ray negatives previously secured, a condition analogous to the proverbial "needle in a haystack" might have confronted us, but with our plates close at hand in the shadow-box, careful and frequent study was made of the relation of the affected member to the surrounding landmarks. The information thus

FIG. 4.



Approximate position of the inverted maxillary third molar. (Zygomatic process removed.)

derived was applied to the actual situation first-hand, with the result that while we had outlined on the skull before operation (Fig. 4), for the benefit of the members of the class, just where we felt the tooth was located, topographically, if reference be made to Fig. 9, A, II, it will be seen that our first application of the bur for bone exenteration was somewhat lower and anterior to what we had reckoned would be the crown. Our intention was to strike the enamel, contact by the bur with this structure conveying an entirely different message to the sense of touch and even hearing, as compared to the sensation elicited by bone and dentin, the latter structures being more nearly akin in their chemical construction and density than enamel

and bone. In short, we were searching for the so-called "enamel feel."

Before going into an explanation of the operation for the removal of the third molar, let us consider the anatomy in this locality for a few moments. Examination of the posterior or zygomatic surface of the maxilla reveals a somewhat quadrilateral-shaped area of bone the boundaries of which we should take as our guiding landmarks in operations in this region, particularly in those of superior third molar impactions. Superiorly this space is limited for its posterior two-thirds by a horizontal fissure, the spheno-maxillary; the anterior one-third being completed by the almost horizontal portion of the maxillo-malar suture. The latter, as it turns at a right angle to take a downward, vertical course, constitutes the upper third of the anterior boundary, which is completed in its lower two-thirds by the external sharp ridge of the malar process of the maxilla and a line drawn from the lower extremity of this ridge as it merges into the alveolar process, vertically downward through the process to the cervical border. Below we find the alveolar ridge, tuberosity, and molar teeth. Posteriorly the space is inclosed by the pterygo-maxillary fissure from the osteologic standpoint, but the tendon of the external pterygoid muscle, as it is exhibited passing from its origin of attachment to the external surface of the external plate of the pterygoid process of the sphenoid, should be our guiding line surgically.

As we have said, our initial endeavor was to cut through the bone to the root at the point described in Fig. 4. The character of the sound and the resistance to the bur, however, led us to conclude that we were grinding into tissue more dense than what should be the usual thin lamina of bone which forms the posterior wall of the maxillary sinus at this point, and yet not exhibiting that "enamel feel." We were therefore impelled to apply the bur a little higher ($\frac{1}{2}$ cm.) and more posteriorly, with the result that we came down upon a hard, resisting, smooth enamel surface. (Fig. 9, A, i.) Greater denudation of the tooth was

made and its exact position noted. While not situated in the pterygo-maxillary fissure proper, it did impinge upon what might be termed its anterior-external border as formed by the angle of junction of the zygomatic and nasal walls of the antrum, the occlusal surface being located within $1\frac{1}{2}$ cm. of the inferior border of the spheno-maxillary fissure. Some idea of its position may be had by comparing the relative lines, as shown in Fig. 4 of (a) the anterior nasal spine, which is on a slightly higher plane than the floor of the nasal fossæ, (b) the malar process of the maxilla, and (c) the articular surface of the mandibular condyle on the skull, with these same lines in the X-ray (Fig. 3), showing the tooth in its native habitat.

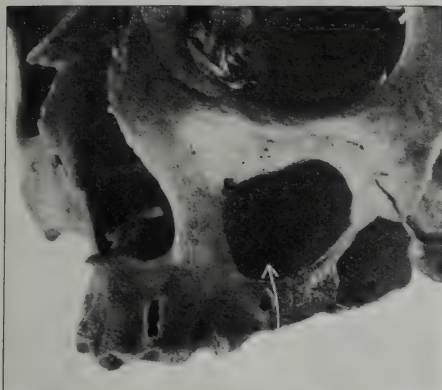
Exploration with a probe demonstrated a slightly cystic condition surrounding the tooth, which latter had comparatively little adhesion to the bony wall or socket, the tooth sitting, as it were, in a cup made to accommodate its roots, which were fused.

Very little exertion was necessary for the removal of the tooth, which was accomplished by passing a Cryer elevator over the cusps from behind forward to its mesial surface with the intention of gouging it out backward. This movement was made with great care and deliberation, occasioned by the fear that if its dislodgment were not made backward it might fall forward into the antrum, a rather disconcerting and troublesome condition thereby resulting. Our misgivings were baseless in this case, however, as will be shown later.

It was considered more than probable by the roentgenologist that this tooth was lodged in the posterior part of the antrum, and it was suggested that its removal be secured through an opening in the bone through the facial surface of the maxilla into the antrum (Caldwell-Luc operation, Fig. 5) and exploring backward in the hope of thus locating it. Truly a much easier method, but beclouded by the specter of direct antral infection, so that with this in mind we deemed it better not to adopt it, our hope being that communication

with the antrum did not exist, which indeed proved to be the case, minute ex-

FIG. 5.



Extent of bone exenteration as practiced in the Caldwell-Luc operation.

amination with a probe failing to establish the existence of an avenue between the cystic socket and the maxillary sinus. Curetment of the cyst walls in an effort to obliterate persistence of the cystic membrane was done. The wound was swabbed with a 1 : 1600 "mercuro-phen" sol., a preparation claimed to have the same germicidal and non-irritating properties as 1 per cent. dichloramin-T solution. Packing of any description was tabooed.

POST-OPERATIVE TREATMENT.

Post-operative treatment may be said to have been pursued along therapeutic and mechanical lines.

Therapeutically the wound was sprayed with sol. liq. antisepticus alkalinus (National Formulary) every two hours for the first four or five days. Some infection, naturally, was present, but this was overcome by irrigation with a solution of 2 per cent. KMnO_4 followed by thorough lavage with copious quantities of warm water, after which about 5 minims of campho-phénique was injected into the wound cavity once daily, alternating with 1 per cent. dichloramin-

T solution in like quantity and manner. At the end of fifteen days the wound had closed entirely. As stated above, packing was not used, the oral fluid seeming to keep the mouths of most stomatic wounds patulous, thus enabling them to drain and granulate from the bottom outward without artificial aid.

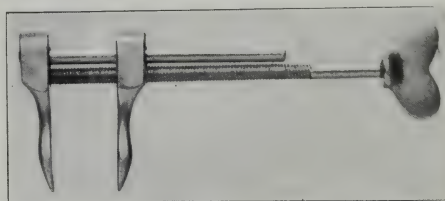
FIG. 6.



TREATMENT FOR TRISMUS FOLLOWING THE OPERATION.

Were it not for reassuring the patient, the degree of trismus which existed for

FIG. 7.



almost four weeks following operation might have caused a serious exacerbation of a pre-existing neurasthenic condition.

So, then, therein lay the necessity for practicing the mechanical treatment previously mentioned. The extent to which

this temporary or false ankylosis existed from the third or fourth day following operation until institution of treatment to overcome it (which we began on the seventeenth day after the operation, or two days after complete closure of the

FIG. 8.



wound had taken place, deeming it unwise to begin stretching the scar tissue before this time) is shown in Fig. 6, the patient being unable to open the bite more than 1 cm. Only after using considerable force could the mouth-gag be

lower teeth in the most extreme case of trismus. It is based on the well-known monkey-wrench principle, although used in the reverse manner. After placing the jaws of the gag between the teeth, the thumb-screw was gently turned, expression of pain due to stretching of scar tissue being our guide for discontinuance, the instrument then being allowed to remain in this position for fifteen minutes,

FIG. 9.



at the end of which time it was slowly loosened and removed. The patient was then instructed to open the mouth as far as possible several times, as well as to swing the mandible to the right and left lateral positions. This treatment was followed morning and afternoon for about one week, with steady improvement as our reward, after which the patient was permitted to use the instrument herself,

FIG. 10.



inserted between the teeth in the bicuspid region as shown in the picture.

The gag (Fig. 7) is a little contrivance designed to be used in those cases wherein great difficulty is experienced in obtaining even the semblance of a separation between the jaws. The manner in which the jaws of the gag are disposed to a somewhat sharp point permits its insertion between the upper and

according to instructions. In the course of the next ten days the mandibular movements had resumed their normal ante-operative limits as shown in Fig. 8.

In the case of the impacted mandibular molar, we felt that, on account of its fairly promising position and its chances of assuming a good position in the dental arch if the intervening media were removed, it would be better to extract

the obstructing second molar and remove the overlying bone, which we did, permitting the third molar to remain *in situ*. Fig. 9 shows (at A) the impacted maxillary third molar after extraction, (B) the lower second molar, and (C) the root shown in Fig. 2, after extraction.

The double-end instrument shown in Fig. 10 is an excellent one for use in cutting and retracting the gum tissue in the region of the third molar, the curve being especially useful in getting back of any teeth which might lie immediately anterior to the third molar, and

also on account of the angular position which must be assumed when cutting in this locality. One end is used as a knife, having a keen cutting edge on its entire border up to the shank, while the other end is employed as a gum and periosteal retractor.

As to the result of our performance, we find much gratification in noting from a recent communication from the patient that she has had entire freedom from neuralgic onslaughts, with a constant material improvement in health, during the past three months.

708 EMPIRE BLDG.

Capillary Attraction in the Treatment of Root-canals.

By PERCY R. HOWE, A.B., D.D.S., Boston, Mass.,

ASST. PROFESSOR OF DENTAL RESEARCH, HARVARD UNIVERSITY; CHIEF OF RESEARCH LABORATORY, FORSYTH DENTAL INFIRMARY FOR CHILDREN.

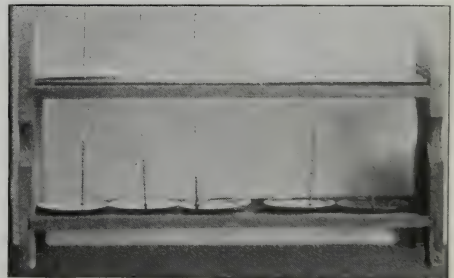
THE following article contains an account of some simple experiments that are designed to show the part that capillary attraction may be made to play in the treatment of tooth roots.

The force that causes liquids to rise in small tubes, in wicking, in blotting-paper, in absorbent cotton, in sponges, and that causes the moisture to rise in the ground, may also cause liquids to rise in a root-canal. It does more—it causes the liquid to permeate the substance of the pulpless tooth. By means of this force the liquid will make its way along any bend that may exist, and it will flow into every foramen. The smaller the caliber of the canal or of the tubuli, the greater is the tendency for the liquid to rise or flow. The size of large canals may be reduced by inserting an instrument, thereby increasing the capillary force. Care must be exercised to avoid stopping the canals with tooth shavings. The cavity and the canal must

be flooded, not merely moistened with the liquid.

Fig. 1 shows the effect of capillary attraction in tubes of different calibers,

FIG. 1.



which correspond approximately in size to the sizes of root-canals. It is seen that when one end of a tube is immersed in the liquid which has been placed in a watch-glass crystal, the fluid immedi-

ately rises. In the smaller tubes it rises higher than in the larger ones. In either case the height of its rise is more than the length of a root-canal.

then cleared out and the teeth stood upright upon a drop of the solution, only deep enough to cover the opening that was made. The solution used was the

FIG. 2.



Figs. 2 and 3 show what has occurred in teeth that have been stood upright, for varying periods of time, upon a drop of liquid. One tooth was so placed for twenty seconds, one for two minutes, one

ammoniacal solution of silver that I have described in an article in the September 1917 DENTAL COSMOS. The solution was placed upon a glass slide, and, as I have stated, the teeth were stood verti-

FIG. 3.



for three minutes, and so on. These teeth were opened into, near the incisal or articular region, with a No. $\frac{1}{2}$ bur; they were drilled until the pulp chamber was reached. The shavings were

cally in this drop of fluid for varying periods. These teeth were treated wet. In no case was any instrument passed into the canals. The effect is self-evident.

I am inclined to believe that in root-canal treatments manipulative skill will eventually give way to science. The effectiveness of treatment depends upon the soundness of our scientific views. The intelligent application of such principles reduces the technique from a highly intricate mechanical procedure to a simple matter. Our object in root treatment is to sterilize and to fill against subsequent infection. This has usually been carried out by sterilizing the canal and filling it with gutta-percha. I have shown by actual tests that we do not get sterility in that way. The substance of tooth root is not sterile; only a surface sterility is produced. I have shown a way of sterilizing this infected dentinal structure and of blocking it. By this method all foramina are also filled. While the treatment is simple in its application, its results far surpass any mechanical procedure, for it sterilizes and fills the microscopic anatomy of the tooth, so to speak.

Capillary attraction is a great factor in carrying the medicaments that I have recommended into the structure of the affected roots. It also carries the antiseptics along all fine root-canals, however crooked they may be. The illustrations seem to show that hardly any instrumentation is necessary. The pain that has arisen when this treatment has been applied by those who have not grasped the principles that I have tried to make clear, also shows that too much instrumentation has been done and that

the materials have passed beyond the control of the operator. Indeed, the illustrations show that the principles of capillary attraction may be made to play such an effective part in root treatments that they may far surpass any mechanical efforts. Flooding an unfilled canal, and working the materials into the larger canals merely by moistened cotton points, have effected clinical results as perfect as could possibly be expected or desired.

If the infections that occur or recur about root-ends are secondary, as I believe them to be, then we should use every practical precaution to avoid anything that will cause traumatic injury in this region. The tissue about a pulpless tooth is not normal at best. Add to this chemical or mechanical trauma and we produce a condition that may subsequently become the seat of infection. It is true that many conditions that we have regarded as sterile are far from being so. It is also true that nature is perfectly competent to handle these conditions, else some of our most elaborate root-work would have to be discarded. I believe, from many cultural tests and from a large number of clinical statistics, that we can produce sterility and protect against subsequent reinfection by the method that I have spoken of elsewhere, and that in this method capillary attraction plays a most important part in carrying the liquids into infected bone or dentinal structure.

10 EXETER ST.

Dental Electro-Diagnosis.

By BERTRAM B. MACHAT, Brooklyn, N. Y.

(Clinic before the Pennsylvania State Dental Society, Wilkes-Barre, April 24, 1918.)

WAS there ever a time in the history of the world when health was so great an asset? Was there ever a time when the human mouth played so important a part as it does now? Was there ever an era in our profession when it was called upon to examine a million mouths at once, and contribute so much to the health of the people at home and an army at war, as is dentistry's task now?

And why? Because it is medical as well as common knowledge that infection is at the bottom of disease in general. It is also common knowledge now that the mouth, chiefly the teeth, is the most prevalent primary factor in transmitting infection to the system. As dentists we should fix our attention upon the facts that devitalized teeth sooner or later become infected, and that sooner or later these infections will morbidly affect the patient. Is it not clear that the dentist's greatest responsibility is primarily that of the diagnostician, and only secondarily that of surgeon and artisan? And while mature clinical experience will go far to recognize extradental disturbances, it is not true of intradental lesions. My experience has proved that an appalling number of diseased teeth go unnoticed.

I hold that no reasonable amount of time, effort, or expense should be spared in the examination of mouths. That the more elaborate searching diagnostic methods (X-ray, bacteriological, and pathological tests)* should be employed

wherever and whenever possible. On the other hand, we have to consider the extraordinary problem confronting dentistry in these days, when in addition to its great task, that of treating a dentally awakened civilian community, our profession is called upon to dentally examine and prepare millions for the rigors of war.

The proverbial saying that "Necessity is the mother of invention" must hold good now. We must bend our energies to devise methods of diagnosis of dental and oral lesions which shall prove dependable, and readily applicable by the general practitioner everywhere. With this end in view, the writer accepted the invitation of your committee to present before you a method of intradental diagnosis which, after years of experimentation, I have found simple of application, highly accurate, safe, speedy, and inexpensive. This method is known as "dental electro-diagnosis."

When a weak electric current is passed through a tooth containing a pulp or any body therein capable of transmitting the current to a point beyond the tooth, a more or less uncomfortable sensation will be experienced, depending upon the strength or pressure of current applied. This is characteristic where we have a normal pulp. On the other hand, a devitalized tooth, having a properly sealed and insulated root-filling, will effectually block the weak current and there will be no sensation.

However, since normal and diseased pulp tissue, liquid and gaseous bodies, metallic root-fillings, etc., differ in their electric conductivity, it becomes necessary to differentiate these varied condi-

* See Machat, *Dental Items of Interest*, October 1918; Machat, *Long Island Medical Journal*, August 1918.

tions by carefully gaging the current and by a process of exclusion, so that we may diagnose the status of the tooth in question. Thus, while the saturation point of a tooth containing a highly engorged pulp may be *nil*, a very considerable current strength may be needed to irritate a normal pulp in a tooth having very thick enamel. Again, variation of current in a given case leads to confusion and faulty diagnosis, hence I have devised an index method, which is the important guide in this procedure. This adhered to, in the test of teeth for their vitality, the diagnostician should, after the skilful application of the electric test, recognize the normal from the inflamed, diseased, or dead pulp.

Electro-diagnosis in dentistry has been vaguely known for many years. Different authors from time to time have mentioned the application of electricity for pulp testing, either in the form of the faradic or the galvanic current. Dr. Hermann Prinz more recently, in the later editions of his "Dental Materia Medica and Therapeutics," has devoted a chapter to that subject, and although his method differs somewhat from that hereinafter described, it will be found highly valuable and instructive.

INSTRUMENTARIUM.

The instrumentarium for pulp testing consists of—

A. A primary instrument—which may be summed up by saying that any electric instrument that is equipped with a finely graduating rheostat will be found efficient. For example, in my own office, where there are both direct and alternating currents, I have made use of a dental switch-board (on alternating), an ionization board with and without the rotary converter in circuit, a small portable electric machine known as a "pulp tester"* on either current, and a cell battery. With the exception of the latter, these have proved satisfactory.

B. This is the essential part in con-

nection with any one of these instruments: A pair of insulated electric cords, having at one terminus an insulated pencil-shaped handle, which should hold a short metallic pin, preferably turned at an obtuse angle (dental electrode), and at the distal end of the second wire cord a metal handle or a sponge (hand electrode). Thus, one having a dental switch-board (direct or alternating), will require a pair of wire cords as above described, which should be attached to two poles on the "low" current of the board. The ionization board is already equipped, while the pulp tester is designed for the purpose, and is complete.

MODUS OPERANDI.

Before making the test, we must determine the degree of electric tolerance, or the irritation point, of the individual whose teeth are to be tested, bearing in mind its variation with different persons. Age, temperament, physical and nervous status, and medication have a definite relation to electric tolerance. Thus, neurasthenics require more, while those that are highly nervous and irritable will respond to the weakest current.

Having inspected the instrument to insure against "shorts," turn on the current and place the "hand electrode," or strap the moistened sponge to the back of the hand. The hand, it must be pointed out, should be free from metallic rings and the like. Now, being careful to turn the short metal pin on the "dental electrode" at an angle so that it may be carried well in the back of the mouth without "shorting," contact is made against the occlusal surfaces of apparently normal incisors and in sulci of bicuspid teeth, meanwhile increasing the current from zero to a point of mild irritation. Note the position of the rheostat, and mark it on your chart or case record. This constitutes the index or guide for the testing of the normality of the remaining teeth.

It is preferable that the "dental electrode" be applied to the deep occlusal

* Manufactured by the Columbia X-Ray and Electric Corporation of New York.

surfaces of the teeth to be tested, where, under ordinary conditions, the enamel would be fairly uniform. This, however, is not always feasible on account of fillings, abrasions, cavities, etc. In such cases other surfaces of the tooth may be utilized, bearing in mind, however, that the condition and thickness of the enamel should offer neither greater nor less resistance to the current than the part of the tooth or teeth taken for the guide.

Where, as in a few cases, the buccal or the lingual surface of a tooth will be the only available position for testing, an index may be obtained from a similar surface of a corresponding tooth on the opposite side, returning, however, to the original index.

The following rules should be remembered:

(1) A tooth requiring an excess of current is not normal. It may have undergone secondary calcification, or the pulp as a result of trauma or disease may have undergone complete ossification.

(2) Where a tooth will respond to considerably less than the established dosage, the indication will be an early pathologic involvement of the pulp.

(3) A tooth known to be devitalized and yet responding plus shows the presence of putrescent material within the canal, or a faulty technique in taking the index.

(4) A tooth failing to respond to an excess of current is positively devitalized.

(5) Eroded and abraded surfaces and roots exposed due to gingival recession will require less current, and the rheostat should be reduced accordingly.

(6) Slight moisture at the contact point of the electrode is necessary; too much will "jump" the current. Complete dryness at either pole will retard the current.

(7) (a) Enamel is a poor conductor. (b) Dentin is a fair conductor. (c) Gases retard the current.

SUGGESTIONS.

Reassure the patient. Promise that you will not cause pain or shock, and be careful to keep your promise. High-

strung patients are apt to mislead one who is not familiar with this test; a little reassurance will help.

The diagnostician should learn to depend upon objective rather than subjective information. The reflex is distinctive to the careful observer.

Every tooth to be tested should be inspected for fillings, cavities, erosions, abrasions, and discolorations. Do not jump at conclusions, but study every phase and failure with a view to localizing its cause. Thus, color is generally accepted as an important diagnostic factor, yet this is often misleading. The writer has found many discolored, apparently "dead" teeth to be vital and normal in reaction; and, conversely, he has found teeth presenting normal outline and color, devitalized. (See case I, Fig. 1, A and B; case II, Fig. 2, A and B, and case III, Fig. 3, A.)

While electric contact with anything metallic in the mouth is to be avoided, the placing of the electrode upon a circumscribed metallic filling in a devitalized tooth will cause no reaction—provided, however, that the filling is free from contact intradentally with metal root-posts, or metallic fillings and cavities in approximal surfaces. The latter will convey the current to the gingiva or to an adjacent tooth, and a false reaction will result. (See case IV, Fig. 4, A, and case VI, Fig. 6.)

The condition of the enamel upon which the test is made is another point of interest. Thus, due to causes that may be inherent, abrasion, erosion, and physiologic and pathologic changes, its density and quality may differ and may correspondingly affect the flow of the current. (Case V.)

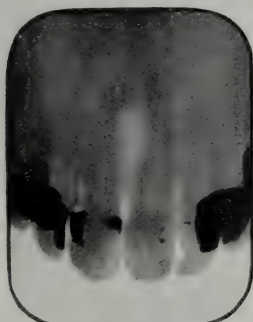
The safe distance between the gum margin or a metal filling and the "dental electrode" in circuit will depend upon the quantity of moisture present and the pressure of current in use.

The differential diagnosis of shell-crowned teeth presents some difficulty; however, since these cannot always be determined by means of radiography, it is advisable, in case of doubt, to retract the gum tissue by means of a carbon blade,

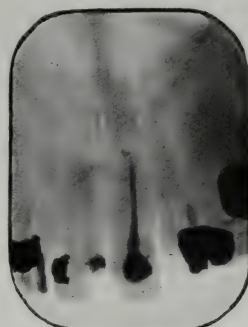
and to make the test with the "dental electrode" at reduced current. In rare cases it is advisable to remove a part or the entire crown to determine the exact status of the tooth. (See Fig. 3, B, and Fig. 7, A and B.)

dex 30 (Columbia pulp tester used, which registers from .1 to 100). All uncrowned teeth react plus; exception, right superior central incisor. This tooth responded, however, considerably above the index point. Color: Right superior central incisor normal; left superior central incisor discolored. Trans-

FIG. 1.



A



B

ILLUSTRATIVE CASES.

For the purpose of demonstrating the above-mentioned points, as also the importance of the electro-diagnostic test in dental examination, the writer has added the following illustrative cases, which

illumination: Right superior central incisor somewhat opaque; left central incisor clear.

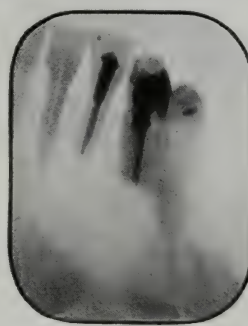
The right superior central incisor was opened into and found devitalized. Some pus was present. The vitality of the left superior central incisor was verified. (Fig. 1, A and B.)

Case II. Mrs. G., age forty-two. Medical history: Headaches, arthritis, and gastro-

FIG. 2.



A



B

have been taken at random in the course of one day's private practice. For obvious reasons, only such data as are pertinent will be given.

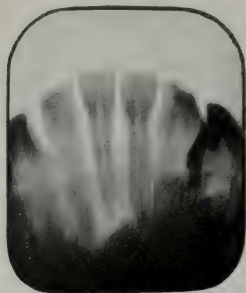
Case I. Mrs. S., age thirty-eight. Medical history: General toxemia, etc. Dental history negative. Electro-diagnostic test: In-

intestinal disturbance. Dental history negative. Percussion (objective) of all teeth negative; exception, right inferior lateral incisor. Color: All uncrowned teeth normal. Electro-diagnostic test: Index 30, all uncrowned teeth react plus; exceptions, right inferior lateral incisor and cuspid. Thermal test negative for both teeth. (Fig. 2, A and B.)

Case III. Mrs. D., age thirty. Medical history: Left hemicrania, left mastitis, occasional otitis same side. Dental history: "Two years before, had violent swelling and

nostic test: Index 40, all teeth responding; exception, right inferior first molar—causing extreme reaction, however, when "dental electrode" is applied to bucco-cervical aspect,

FIG. 3.



A

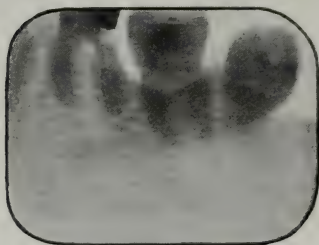


B

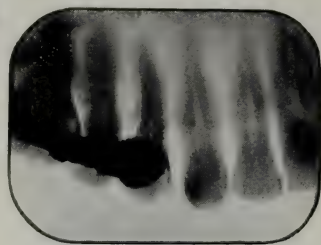
pain with much pus, left side of the mouth; the third molar extracted. General physical condition at first better, later grew worse," etc. Palpation: Left submaxillary gland and nodes enlarged. Tenderness in region of shoulder. Percussion of all teeth negative;

where root was exposed by recession of gum. (Fig. 4, A.) Here the current "shorted" by way of distal cavity. After further verification (drilled into) tooth was found devitalized. Immediate extraction and removal of granuloma at distal root followed. (See also

FIG. 4.



A



B

exception, left inferior central incisor (objectively and subjectively). Color good; no exception. Electro-diagnostic test: Index 20, all uncrowned teeth reacting plus; exceptions, left inferior central incisor, second premolar (gum retracted), and second molar. Thermal test negative; exceptions, right inferior third molar, left inferior second molar (to heat). (Fig. 3, A and B.)

Case IV. Mrs. W., age forty-four. Medical history: Arthritis, with articular involvement of fingers of both hands. Dental history: Occasional neuralgia, right mandibular region. Percussion negative. Electro-diag-

Fig. 4, B.) The bicusps, radiographically uncertain, were verified "vital."

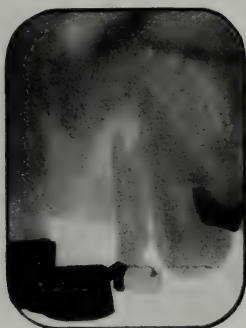
Case V. Mr. R., age fifty. Medical history: Paralysis agitans. Dental history negative. Color: Nearly all uncrowned teeth more or less discolored, reddish-yellow. (Patient does not smoke.) Percussion: All teeth negative; exception, right superior lateral. Electro-diagnostic test: Index 90-100, all uncrowned teeth responding plus; exceptions, right superior lateral and left superior central incisor (latter window crown), and right inferior cuspid. Thermal test: All negative.

Right superior lateral and left superior

central incisor verified devitalized; left superior second molar verified vital. (Fig. 5, A and B.)

left superior second premolar. Further testing of this tooth upon small occlusal filling, acute reaction occurred. (Fig. 6.) Latter

FIG. 5.



A

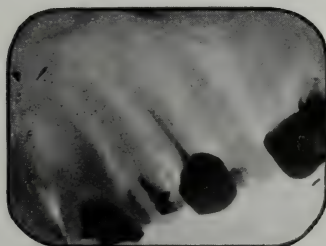


B

Case VI. Mrs. C., age thirty. Medical history: General toxemia, otitis media, throat

reaction occurred by way of a "short" through mesial cavity.

FIG. 6.

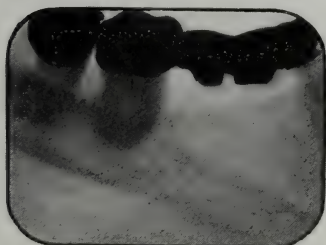


trouble; recent Spanish influenza and pneumonia. Dental history negative. Color nega-

Fig. 7, A and B, shows another radiographic dilemma. Removal of crowns and careful electric test proved the second molar vital and third molar devitalized.

Do not quit simply because you get no immediate results; remember that every procedure worth knowing requires patience, and—as in radiography also—considerable monetary investment plus time and experience. The fact that the dental electric test calls for little or no initial outlay should likewise be no deterrent to perseverance and ultimate success.

FIG. 7.



A



B

tive. Percussion negative. Palpation negative. Electro-diagnostic test: Index 15-20, all uncrowned teeth reacting plus; exception,

Teeth so tested should also be checked up by means of other diagnostic methods when possible, radiography especially, if

for no other reason than to determine the comparative and co-operative value of these tests; generally, dental electro-diagnosis will be found the deciding factor.

In the writer's hands, in the examin-

ation of registrants for the army, in hospital wards, at the bedside of private patients, and in his office practice, this method of dental examination has been found indispensable.

32 COURT ST.

The Use of Orthodontic Appliances in the Treatment of Fractures of the Mandible and Maxilla from War Casualties.*

By ARTHUR ZENTLER, D.D.S., New York, N. Y.

DEPARTMENT OF ORAL SURGERY, COLUMBIA UNIVERSITY, ADVANCED COURSES FOR PRACTITIONERS.

(Lantern demonstration and lecture before the annual meeting of the Eastern Association of Graduates of the Angle School of Orthodontia, New York City, May 7, 1918.)

IT is rather for the purpose of paying a tribute to Orthodontia than with a pretense to imparting any knowledge, that I have accepted the much-appreciated invitation to appear before your society.

The great benefit that restorative oral and facial surgery for defects caused by modern trench warfare has derived from the teachings of orthodontia has placed this branch of orthopedics in the position of being as proud of its achievements as any one of the other means or methods employed for reclaiming the war-maimed for society.

One need only compare the ultimate appearance of those who were not fortunate enough to obtain treatment with the aid of orthodontic appliances for war wounds resulting in jaw defects, with that of those who have had the benefit of such treatment, to realize the great need in military hospitals for men acquainted with the principles of orthodontia and the practical application of

it, in collaboration with the oral and plastic surgeon.

For the purpose of demonstrating this, I will throw upon the screen illustrations showing the result of two cases treated with the more rudimentary method of bandaging, etc., in comparison with a few treated with orthodontic appliances.

I shall refrain from going into details of treatment in the cases showing unhappy results, the main purpose in showing these being that of comparison of ultimate results. I shall, however, show the average method of bandaging, which is mainly responsible for the resultant malrelation of the parts, and show in detail the cases treated with orthodontic appliances.

ILLUSTRATIONS.

Fig. 1 shows the first aid emergency bandage (a modification of Barton's bandage). If left in position for a considerable length of time with the inten-

* Information and illustrations obtained through courtesy of Bruhn, Hauptmeyer, Kuehl & Lindeman.

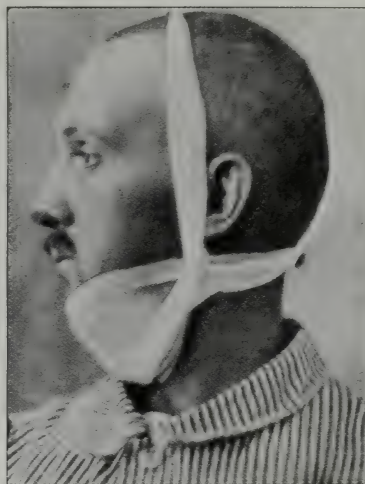
tion of supporting the fractured portions, it results in extensive suppuration,

used only temporarily, as otherwise untoward results will follow.

FIG. 1.



FIG. 2.



loss of tissue and adhesions, and brings about eventually an uneven healing with malrelation of the involved parts.

Fig. 3 shows the result of an attempt at retaining the fractured parts of the mandible with the previously shown

FIG. 3.



FIG. 4.



Fig. 2 shows a chin bandage which, while preferable to the one shown in Fig. 1 because of insuring free normal motion and at the same time holding the fractured parts in place, should also be

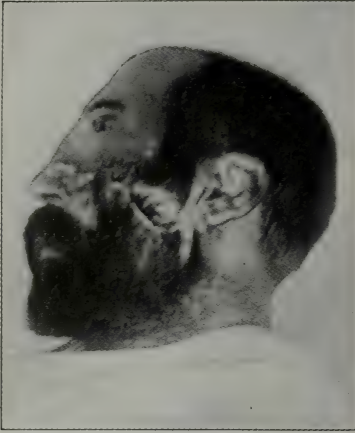
emergency bandage. Note the adhesions and the position of the chin, and it is easy to imagine the resultant malocclusion.

Fig. 4 shows a similar sad result in a case of mandibular fracture treated with the chin bandage and splint.

Fig. 5 shows a defect starting below the left ear and reaching over the right

wing of the nose, due to a bursting grenade. There is no fracture of the bones of the nose, but the infraorbital ridge is

FIG. 5.

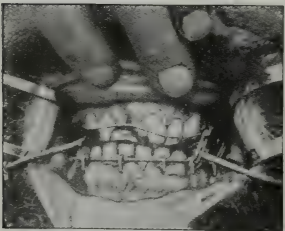


broken and the left eye has almost wholly lost its function. The defect includes the hard palate, the condyle, and the infra-

FIG. 6.



FIG. 7.



orbital ridge on the left side, as well as the left third of the mandible. The hard palate with the alveolar process is sev-

ered from the skull and is only loosely attached to the soft parts, being easily moved from side to side.

Fig. 6 shows the position of the mandible and the maxilla, reclining to the left and making the taking of nourishment very difficult.

FIG. 8.

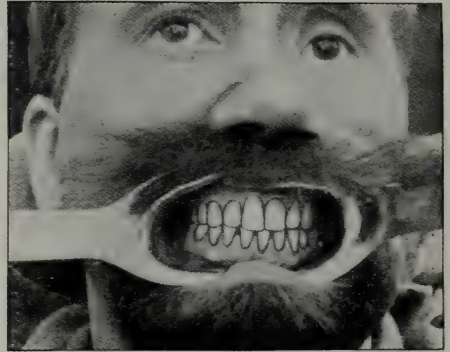


Fig. 7 shows the orthodontic appliances used after removing the loose portions, touching the soft parts with a $\frac{1}{2}$ per cent. solution of silver nitrate, and reducing the fracture. The heavy lower arch is ligated to the teeth, and, like the

FIG. 9.



upper arch, is provided with metal hooks for intermaxillary elastics, which can be seen in use, for holding in apposition the loose left portion of the mandible.

Fig. 8 shows the result of the treatment three and a half months after ad-

mittance to the hospital and not quite four months from the date of injury, the right upper central having been artificially replaced.

Fig. 9 shows a defect produced by a bullet entering in front and above the

weeks, the fracture having consolidated, the appliance was removed.

Fig. 12 shows the case two weeks after removal of the appliance.

FIG. 10.



angle of the right ramus, penetrating and destroying the palatal portion of the right maxilla, so that the process holding the anterior teeth is entirely loose.

Fig. 10 shows the patient as brought into the hospital with the emergency

FIG. 11.



bandage on, the maxillary anterior teeth protruding about $\frac{1}{2}$ cm.

Fig. 11 shows the use of orthodontic appliances after reducing the fracture, for the purpose of holding the mandible and maxilla in proper relation, with the aid of intermaxillary elastics. After six

FIG. 12.

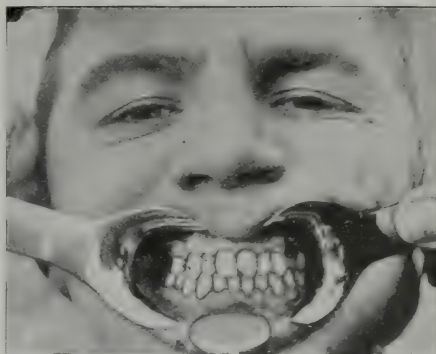


Fig. 13 shows a defect produced by shrapnel shot entering the lower edge of the chin and lodging in the mandible, after fracturing the right portion and tearing out the cuspid and the bicuspid with their alveolar process.

FIG. 13.

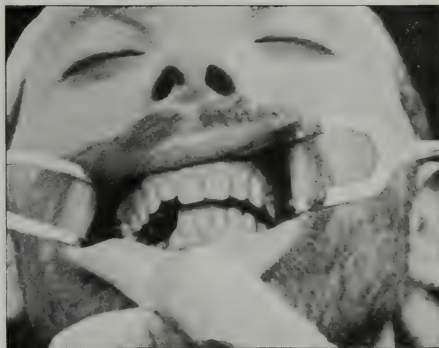


Fig. 14 shows the roentgenographic lateral view of the fracture line, following the lower edge of the mandible through the center and horizontally to the right toward the chin. The shrapnel is seen in the region of the chin.

Fig. 15 shows the appliance used after removing the shrapnel piece, treating the fracture débris as formerly described,

and reducing the fracture. The appliance, Schroeder's sliding joint, bears relation to orthodontia, inasmuch as it was originated for the purpose of what was known as "jumping the bite."

Fig. 16 shows the appliance in position holding the remaining teeth in occlusion.

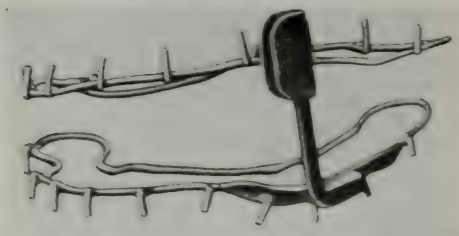
FIG. 14.



Fig. 17 shows the case two months after admission to the hospital, with the appliance removed and the original occlusion re-established.

Fig. 18 shows again a case where the patient was brought into the hospital

FIG. 15.



with the emergency bandage on. The wound was produced by a bullet entering from the left side of the mandible, which is seen dropping to the side about 1½ cm. Palpation disclosed a multiple fracture with only slight disturbance on the left side, but a great deal of bone destruction on the right. A good deal of trismus was present.

Fig. 19 shows the roentgenogram, indicating the completely severed parts. These include a triangular portion around the chin, as well as a good portion of the angle of the ramus on the left side. The third mandibular and

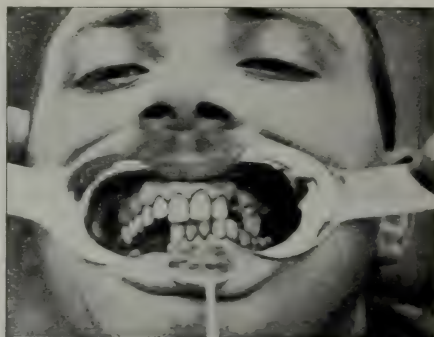
FIG. 16.



first and second right maxillary molars are also fractured.

Fig. 20 shows the same type of appliance seen previously—Schroeder's sliding joint—in position. After treating the flesh wounds as formerly described

FIG. 17.



and packing with iodoform gauze and lightly bandaging, the trismus subsided, when impressions could be obtained, the fracture reduced, and the appliance inserted.

Fig. 21 shows the case two and a half months after admittance to the hospital,

with appliances removed and the teeth brought into original occlusion.

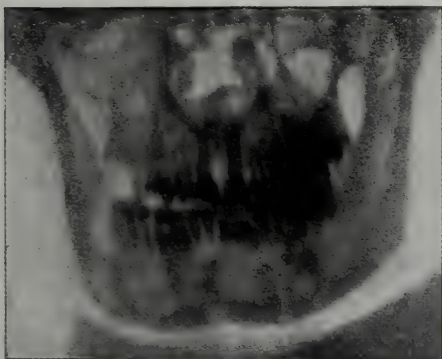
In conclusion I wish to say that it did not seem necessary to me to go into the construction and mode of insertion of appliances, as I am sure that all those

FIG. 18.



acquainted with orthodontic procedures cannot fail to grasp the needs of each individual situation and to apply to it the most appropriate technique. The principles governing the treatment of all these cases, as regards the orthodontist, are those applied in the movement of teeth, stimulation of cell growth, and retention. They are therefore problems

FIG. 19.

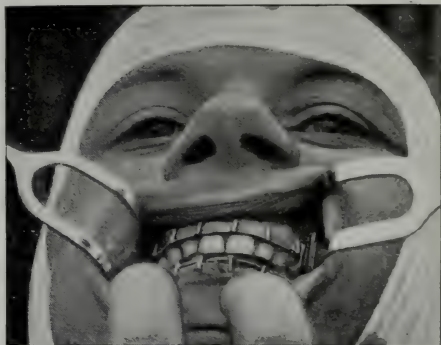


with which the orthodontist is thoroughly familiar.

It remains only to call attention to the fact that while modern orthodontia practice is diminishing the diameter of the arches used for treatment, the diameter of the wire used for arches in fracture cases is of necessity much heavier. It is never less than 2 mm. and often $2\frac{1}{2}$ mm.

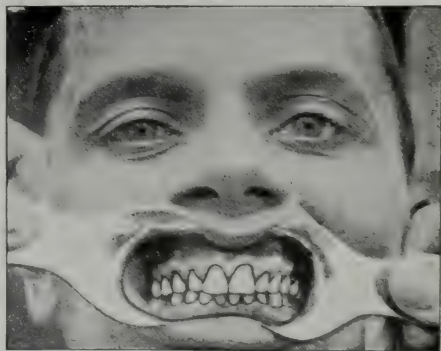
in diameter. I may also call attention to the fact that if it is important in usual orthodontic treatment for anchor bands to be extremely well fitted and properly cemented, it is doubly important that these two factors should be

FIG. 20.



especially well observed in fracture treatment with orthodontic appliances, the parts brought into correct relation having a great and constant tendency to relapse until complete consolidation of the bone has taken place.

FIG. 21.



The fact that not only methods and appliances at present in vogue in orthodontia, but even such as have been discarded by the modern orthodontist, can successfully be adapted and used in treatment of fractures is surely more than gratifying.

8 WEST 40TH ST.

The Foundation Principles in the Mechanism of Speech, and the Importance of Training the Speech of Cleft-Palate Patients After Operations.

By CALVIN S. CASE, M.D., D.D.S., Chicago, Ill.

(Continued from page 10.)

Part II.

RESONANCE.

THE quality of voice known as resonance and melody, which is quite as important to perfect speech and vocal music as distinct articulation, no doubt starts to be imparted to the voice in the trachea and continues to characterize its tone by different forms of the pharyngeal and oral channels through which it passes in the mechanism of speech. But this is only a part of the resonating quality of speech. The voice vibrations readily pass through the closed velum to the real "sounding-board" of the head, whose resonating chambers mainly characterize the quality of the voice, *though completely shut off from the air below the palate*, which is engaged in uttering the distinct articulations of speech. A person outside of a thin hermetically sealed door can be distinctly understood by one on the inside if he speaks loudly enough, and yet not a particle of the vibratory air of voice, *per se*, penetrates the door. The substance of which the door is composed is thrown into voice vibrations, which in turn are imparted to the air on the inside, and thus reach the ear as spoken language. This same principle is exemplified in the diaphragms of telephone transmitters, receivers, etc.

It will be seen that the velum palati in the normal state is not only the chief organ which permits and aids distinct articulation by completely closing the

naso-pharyngeal passage, but it is also a perfect transmitter of voice vibrations which give to speech its main resonating quality. In fact, pure resonance and clear vocal tone-quality in all vowel utterances of the English language seem to require this closure—a thing which cannot be said of the French and possibly many other languages. In speaking any of our vowels with a forcible guttural prolongation we notice the distinctly marked difference in the character and quality of the tone with this passage closed and with it open; this plainly indicates the functional mechanism by which the voice in nearly all requirements of speech readily passes through a closed palate to the upper resonating chambers, and not back of an open palate.

It is only through an understanding of the functions of the velum palati that we gain a true conception of its indispensable action in the mechanism of speech and are able to realize fully the object and difficulties of an operation for the restoration of a cleft palate by surgical or artificial means. It forms also an important foundation for an intelligent comprehension of the art of speaking correctly.

THE ORAL ELEMENTS OF VOWELS AND CONSONANTS.

The alphabetical symbols which stand for the oral elements of speech in the

English language are divided into vowels and consonants. An ORAL ELEMENT, or elementary sound, is one which is uttered with a single impulse, always with the same mechanism, and which cannot be divided into separate sounds. Words are composed of oral elements the same as chemical compounds are composed of chemical elements. Like chemical elements also, they are represented to the eye by symbols composed of one or more letters of the alphabet. For instance, in the word **cat** there are three oral elements, whose phonism may be represented to the eye as **kă-a-tŭ**, whereas in **ought**, a word of five letters, there are only two oral elements, **au-tŭ**.

In practicing separate utterances of the oral elements which are represented in written language by the alphabet, or symbols of speech, they should be enunciated with a short quick utterance so as to avoid mixing the voiceless breath consonant sounds with the adjoining voice sounds of the vowels. In representing to the eye of the student or the pupil the separated explosive consonant oral elements for teaching purposes in this work, the symbol **ŭ** or **ă** (*i.e.*, short) is added to the consonant letter. Thus in representing the explosive oral element of **b** in the word **but**, it is **bŭ**, and uttered with a quick breath emission by the sudden parting of the lips, and by not permitting the sound to run into the vocal sound of the vowel **u**. The oral element of **u** in **but** is sounded like **ŭh**, and the **t** is represented as **tă** or **tŭ**, and is made with a sudden explosive breath emission, and so on. While it is a fact that in the perfect pronunciation of a word the explosive elements are indistinguishably joined to the vowel elements, the sounds are there nevertheless, and their distinct and separate utterance should be considered as the first requirement in teaching cleft-palate pupils to enunciate any of the words in which the explosives occur, because these are the utterances in which they most often fail.

When a syllable or a word is pronounced properly, it is characterized by a succession of the ORAL ELEMENTARY SOUNDS of which it is composed. *Each*

one of these sounds requires different muscular movements, and however quickly the word is spoken, if uttered distinctly, all the movements and positions necessary for the utterance of each separate element must always occur in the succession of their position in the word.

In papers which have recently been read before medical and dental societies in regard to the function of speech, there seems to be no recognition of distinguishing differences between the sounds of the letters of the alphabet and the sounds of the oral elements of speech of which the letters are nothing more than the visual symbols. While all the vowel elementary sounds are similar to the phonetic sounds of the vowel letters, the names of the consonant letters when written or spoken are composed of two or more oral elements which when pronounced may have very little semblance in sound to the oral element in speech which this letter or symbol stands for.

In other words, in pronouncing the names of the letters which stand for the vowel elements—**a**, **e**, **i**, etc.—we find that the different sounds compare favorably with the elementary sounds of these letters in speaking the words in which they occur, except in diphthongs and silent letters, because the naming of any of the vowels is in itself an utterance similar to their phonetic elemental sounds. In this particular they differ quite decidedly from the *names* of the consonants, each one of which requires a vowel in its pronunciation, and in the spelling of its name, as **be**, **de**, **te**, etc. Therefore, in speaking the names of the consonants, we are not uttering the oral elements which they stand for in speech, but two or more oral elements—thus **b** is a sudden short explosive breath sound, **bŭ**, and a vowel element, **e**—otherwise they would have no character if uttered alone as do the vowels. Furthermore, the spoken name of several of the consonants shows little or no resemblance to the oral element which the consonant symbol stands for in speech. For instance, in pronouncing the name of the letter **h**, we find that it is composed

phonetically of two oral elements, **a** and the breath emission **ch**, but its *oral element* in the word **horse**, **house**, etc., is an open aspirate which is a forced breath sound made at the back of the mouth or in the throat, and quite different in sound from the word **aich**, which is made principally at the front of the mouth. Again, in the phonetic pronunciation of the name of the letter **w**, it is found to be composed of four oral elements, **dū-bū-l-u**, which in combination is quite unlike the open aspirate oral element made at the lips which the symbol stands for in **wood**, **wet**, etc.

There is another distinguishing difference between vowels and consonants. Each one of the vowels has a number of oral elements, which are quite distinctly different in sound, and are made with a slightly different mechanism, as

ā	ǎ	ä	à	â
ale	bat	arm	ask	care

etc.; whereas each of the consonant oral elements is characterized by a single sound and mechanism.

Broadly speaking, the vowels are the body or framework of speech, and the consonants are the finishing touches which give to speech its sharply defined characteristics. The vowels are the open voice sounds, and the consonants are the forced breath sounds, and while the latter are frequently vocalized, their main function is to give distinct enunciatory quality. In order to understand the composition and mechanism of the oral elements of speech, a clear conception of the distinctive parts of speech which enter into their formation, together with the distinctive characters of the physiological movements and positions they require, is of imperative importance.

VOWELS.

The VOCALS, OR VOWEL ORAL ELEMENTS, whose symbols in the English language are **a**, **e**, **i**, **o**, **u**, and final **y**, are those utterances which impart to speech its main voice tones; and whether uttered with voice or whispers, they are

the open, or the least interrupted of all the elementary sounds of spoken language. They are characterized by the different forms of the pharyngeal and oral cavities through which they pass more or less freely. They demand for their perfection of tone and resonance a complete closure of the palato-pharyngeal passage, though they may be uttered with perfect enunciation with the palate open. While the vowel sounds seem to be the most hopeful parts of speech to correct in the preliminary examination of a cleft-palate patient, they are almost invariably the last in which perfection of tone is acquired. The reason for this is evident. The vowel utterances of cleft-palate pupils are at first so much more perfect than the consonant utterances that they are given little thought in the primary efforts to articulate distinctly, until finally, when quite perfect articulation is acquired, we have lingering that unpleasant nasal resonance which is so common with those wearing vela or obturators attached to plates, or those with surgically corrected plates. This shows (1) the demand in vowel utterance of an absolute closure of the naso-pharyngeal passage, and (2) the need of a palate which will have the voice-transmitting properties of the natural palate.

CONSONANTS.

The CONSONANT ORAL ELEMENTS are the forcible breath sounds of speech, which are far more completely interrupted in their construction than the vowel elements. While many of them are uttered without voice, others are intoned by vibrations of the vocal cords from the very start, which finally blend into the true sounds of the vowel tones. They give to spoken language its real enunciatory quality. Under normal conditions they demand for distinct and perfect articulation the full functional involuntary activity of the velum palati to completely close and open the nasal passage; consequently they are the most difficult for persons with a cleft of the palate to utter intelligibly. They may be properly classified upon the basis of

the peculiar character of sound which is made in their perfect utterance by a complete closure of the nasal passage.

INTRINSIC VALUE OF ILLUSTRATION.

It may be well to state that phonological illustrations showing positions of the tongue, lips, etc., in different movements of correct articulation, as in the classified Chart herewith, are really not necessary to a competent teacher who speaks distinctly, except that it may aid him in making the drawings for his pupils showing the proper positions for the utterances in which they fail. Every person who speaks with accurate articulation and tone, utters each oral element in exactly the same manner and with the same action and position of the muscles and oral organs of speech. The sounds may differ in their timbre, their melody, and their resonating quality, but each of the elementary utterances of perfect speech is always made with the same mechanism; and this is true of all languages, the oral elements differing as the languages differ. Therefore, the teacher may easily make the required drawings, as did the author when making the accompanying chart, without reference to or a thought of other published illustrations, by carefully noting the positions of his own tongue, lips, etc., in the correct enunciation of each of the consonant oral elements, commencing at the front of the mouth and going back, *i.e.* the labials, the labio-dentals, the linguo-dentals, and the linguo-palatals. The author has adopted this same order in placing the consonant oral elements in the classification illustrated by the Chart.

CLASSIFICATION OF CONSONANT ELEMENTS.

In a classification of the consonant oral elements for the purpose of instructing those who may be called upon to teach cleft-palate patients to speak perfectly after operations, and to confine the work to purely practical methods adapted to our purpose, the author has not attempted a full outline of all the oral ele-

ments important in general phonology and orthoepy, the object being rather to base the work upon the functions of the velum palati, of which these pupils have hitherto been deprived—hoping in this way to enforce the acquirement of the higher possibilities and full activities of the velum obturator, or of the surgical palate. A more extensive and erudite endeavor would only serve to complicate and cloud the efforts of these unfortunates, whose only object is to learn to speak distinctly, and who therefore are not supposed to acquire the advanced educational principles of this work, which are mainly intended for teachers, or those who, it is hoped, will undertake the teaching of their cleft-palate patients, and who therefore should fully understand the basic principles of phonology, which strictly pertains to this department.

Slight differences between the sounds and mechanism of the same consonant oral elements uttered by different persons, which may be acquired by association with different provincial sounds of the vocals, and possibly with different provincial pronunciations, have always rendered it impossible for authors to determine whether certain oral elements should be placed in one of their classes or the other. The principal object of a classification to a pupil whose mechanism has always been deficient, is that different sound utterances should be systematically grouped solely on the basis of their phonation and mechanism, so that they will aid him in acquiring not only correct sound-images, but the manner of their construction.

The special classification which is here adopted divides the consonant oral elements into four classes: Nasals, Explosives, Open Aspirates, and Explosive Aspirates, and is one which has gradually developed in the author's practice through many years of prosthetic correction of cleft palate and the subsequent teaching of these patients to speak. It is made mainly with the view of presenting important distinctions between the sound-images of elements whose mechanism is quite similar and conse-

quently difficult for the patient to acquire without special drilling. This has particular reference to certain elements in "open" and "explosive" aspirates, which will be appreciated when one distinctly enunciates the beginning oral elements of **w** and **wh** in the words **watt** and **what**, both made at the lips with exactly the same positions, but with different breath or fricative force. Cleft-palate pupils will often easily acquire a perfect articulation of the beginning of the word **water**, and then will work for weeks on the beginning sound of **when**, not because they lack in physical means, but because they fail to acquire a fixed and retentive conception of the sound-image.

NASALS.

The NASALS are the only elements of speech in which the palato-pharyngeal passage is required to be open for the free passage of the vibratory breath of voice. Nasals are composed of the sounds of **m**, **n**, and **ng**, which, it will be found, demand closed stops to drive the column of vocalized breath directly into the nasal chambers for the production of that peculiar nasal resonance characteristic of these utterances. Therefore they are the only sounds which most patients with open clefts will perfectly utter with proper tone and resonance. The resonance and enunciatory character of the nasal elements are regulated by the points at which the stops occur, and which determine the size of the oral cavity *back* of the stop as a part of the resonating area.

The NASAL ELEMENTS are made with a sound similar to musical humming tones, but of course with short quick action, like nearly all oral elements; the vocalized breath being driven by the aid of the full stops directly into the nasal chambers.

For the oral element which the symbol **m** stands for, the stop is formed by a complete closure of the lips. In the word **mother** it is the sound which comes before **other**, and ends with a slight explosive as it merges into the vocal.

For **n**, the stop is formed by a com-

plete closure at the end and sides of the tongue against the anterior part of the hard palate and along the gingival borders.

For **ng**, by a closure of the dorsum of the tongue against the anterior portion and sides of the soft palate.

EXPLOSIVES.

EXPLOSIVES are the elements of speech which demand quite a pressure of breath back of a full stop, to be followed immediately with a sudden opening of the stop for the emission of the completed utterance or explosive, which may occur at the beginning or ending of a syllable or word.

The English symbols which represent the EXPLOSIVE ORAL ELEMENTS are **b**, **d**, **c** (hard), **g** (hard), **k**, **p**, **t**, **th**, and initial **y**.

For the purpose of definitely symbolizing the sounds of the explosive oral elements which these letters stand for in words, the author, as before mentioned, has chosen the short sound of **ă** and **ŭ**—pronounced **ŭh** with a short, quick utterance—to complete the symbol, because its utterance comes nearer than any other one sound in representing the completed explosive when uttered alone. When the explosive oral elements are thus phonetically symbolized and arranged respectively as regards positions and mechanism of utterance, from the front to the back of the mouth, they are as follows:

For **bŭ** as in **boy**, **pŭ** as in **pull**, the stop occurs between the lips.

For **vă** as in **vain**, between the lower lip and upper front teeth.

For **thŭ**, as in **the**, **those**, etc., between the flattened end of the tongue and upper front teeth.

For **dŭ** as in **do**, **tŭ** as in **take**, **kŭ** or **cŭ** (hard) as in **Kate**, **call**, etc., and **gŭ** (hard) as in **go**, the stops occur between the tongue in various positions and points on the roof of the mouth, from the front teeth to the middle of the soft palate. These positions and points will be somewhat varied with different individuals. (See Chart, pp. 140-41.)

The EXPLOSIVE ORAL ELEMENTS repre-

sented by the above symbols, and also the **ASPIRATE EXPLOSIVES**, are among the most difficult for cleft-palate pupils to enunciate distinctly. This is not surprising when one remembers that the proper placing and utterance of all sounds requiring full stops and small constricted channels made by the lips and tongue, have—with rare exceptions—never been fully accomplished by them. The most of them know absolutely nothing as to how and where to place and shape the tongue in the utterance of the greater proportion of these sounds, and in their efforts they will handle the tongue with a degree of awkwardness indicative of a complete lack of mental control. Often they will never arrive at the correct movement except through an involuntary action of the muscles in efforts to imitate the sound-image. Therefore they should be required to practice these isolated sound elements with a short, sharp, distinct forcible utterance before attempting to pronounce the words in which they occur. When this is perfectly acquired, they may then be joined to all the long sounds of the vowels, as **bā, bē, bī, bō, bū**, etc.—connecting the explosive sound-elements with all the phonetic sounds of each of the vowels. These sounds should never be practiced at first, except in the presence of the teacher, or until the sound-image is acquired.

Often it will be found that pupils will immediately and correctly connect the explosive with one sound of a vocal, while with other phonetic sounds of the same vowel they will require practice for days and even months—as instanced by the patient who rapidly acquired the ability to utter distinctly most of the elementary sounds, but who practiced for weeks before he was able to properly join the explosive **tū** to **o** or **oo**, though he was able to perfectly make both oral elements separately. In these cases, the practice consists in drawing the separated sounds closer and closer together until they merge into each other.

It will be observed that in some of the above examples the beginning explosive sound is started with the voice or vocal-

ized breath, as **dū** in **day**; while with other explosive-like sounds, as initial **f**, it starts with the expelling of unvoiced breath, but ends with a distinct explosive as it joins the vocal in **fū, fall**. This is a fine distinction which possibly has not been found necessary in the general teaching of the science of phonology, but its recognition and application is nevertheless of considerable importance in teaching those who have never made a correct approach to distinctness in explosive and aspirate utterances. It is partly this which has led the author to form the class named “Explosive Aspirates.”

With all the explosive sounds which begin a syllable and are uttered with perfect distinctness, there invariably occurs a more or less sudden liberation of the utterance before it joins the vocal. This plainly indicates preliminary accumulation of compressed breath back of a full stop, and this could only be possible with the palatal passage completely closed. With certain oral elements which are placed in this class, and also under “Explosive Aspirates,” the explosive sound is almost imperceptible, because it is drowned by the aspirate part of its utterance, as initial **f, l, ch**, in **fate, late, choose**, etc. This has led authors to classify these utterances solely under “Aspirates,” and also because when used as finals they are clearly open aspirates. But inasmuch as it is found that the distinctive part of the utterance which cleft-palate pupils fail to make is the explosive part, or the part which demands a sudden liberation of compressed breath, however inaudibly it is sounded, it seems important in our teaching that phonetic differences should be sharply defined, and that we should not be obliged to cling to a classification that is inadequate in *our* field of orthoepy, however well established it may be phonologically.

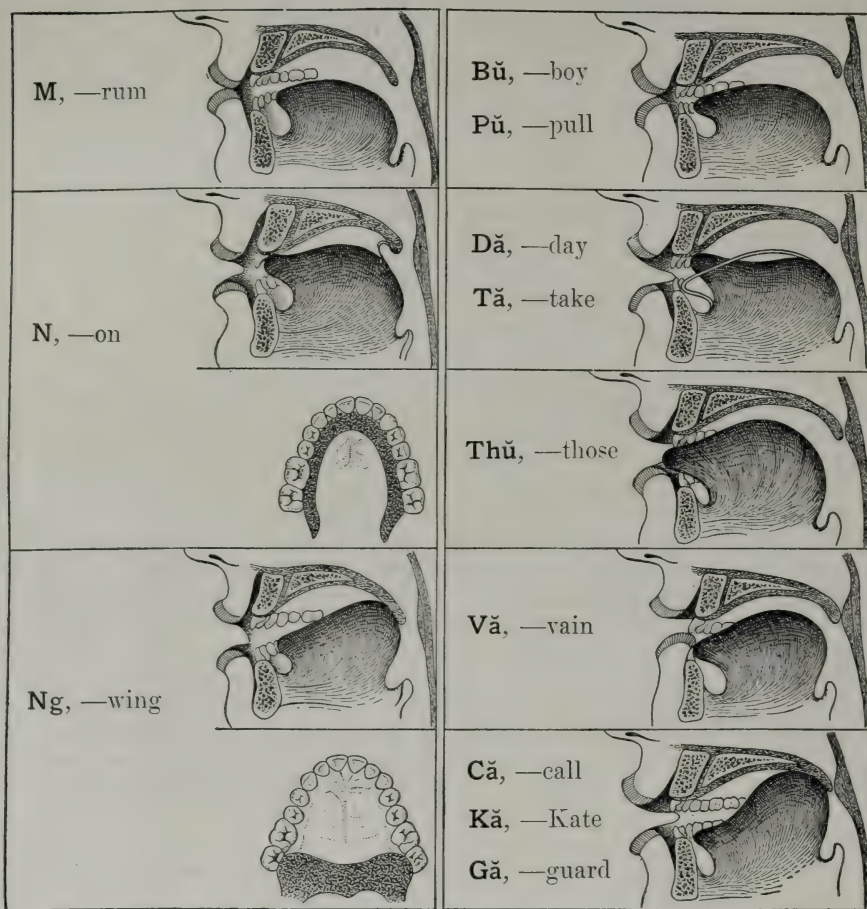
While it is possible in seemingly well-spoken language of ordinary speech that certain elements which should have distinct explosive utterance are slurred into sounds more like aspirates without special notice, nevertheless in teaching pu-

PHONOLOGICAL

Relative Positions of the Tongue, Lips, Teeth, and Palate, in

NASALS.

EXPLOSIVES.



pils who have never intelligibly, or at least distinctly, uttered these sounds or employed the proper methods, the author believes it to be imperative that the sharp and distinct utterance of these elements, especially those with stops, should be insisted upon. One of the main reasons for this particular kind of training is that it is the *only* way in which the undeveloped muscles in conjunction with the obturator can be taught to involuntarily close the palato-pharyngeal passage. In the continued efforts toward this accomplishment the inhibited growth and dormant activities of the palatal and

pharyngeal muscles, through lack of use, will become revived and no doubt stimulated toward assuming their normal inherited properties.

ASPIRATES.

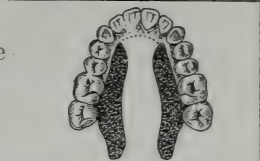
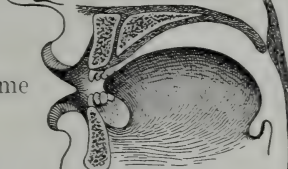
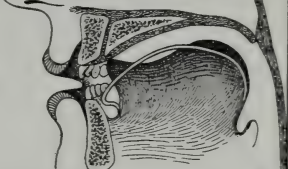
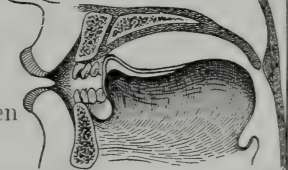
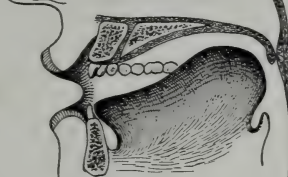
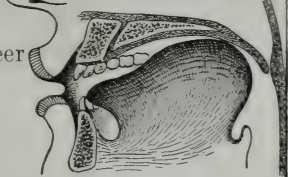
The ASPIRATES are the parts of speech uttered with a forcible expulsive or fricative emission of the breath through a constricted opening. They are characterized by the form of the opening and oral channel through which the breath is forced, and a variety of muscular actions which render them quite distinctive in

CHART: Showing

Uttering the Four Classes of Consonant Oral Elements of Speech.

OPEN ASPIRATES.

EXPLOSIVE ASPIRATES.

C, —cell S, —still Ză, —zebra 	Chă, —chart Jă, —James Gǔ, —George 
Sh, —shame 	Lă, —late 
L, —still, <i>similar to lă</i> R, —bur, “ “ rǔ	Rǔ, —run Wh, —when 
Hă, —hat 	Qǔ, —queer Yě, —yes 
F, —cuff, <i>similar to vǎ</i>	Fă, —fan, <i>similar to vǎ</i>

the quality and character of their utterance. The sounds of the aspirate oral elements may be divided into “Open” Aspirates and “Explosive” Aspirates.

OPEN ASPIRATES.

The OPEN ASPIRATE elements are continuous sounds, mostly voiceless breath

sounds, with no abrupt or explosive beginning or ending, and blend evenly into the VOWEL TONES to which they are joined. The English symbols which represent the open aspirate elements are **c** (soft), **f**, **h**, **l** (soft), **r**, **s**, **sh**, **wh**, and **z**. When phonetically symbolized and arranged respectively as regards position

and mechanism of utterance they are as follows:

In the utterance of **wh** as in **when**, **what**, etc., the breath blast emission is at the lips.

In **f** (final) as in **half**, **stiff**, etc., between the lower lip and upper teeth.

In **c** (soft), **s**, and **z**, as in **cell**, **so**, **zeal**, etc., at the tip end of the tongue and anterior palatal surface.

In **sh** as in **shame**, **show**, etc., between the broadened blade of the tongue and anterior hard palate.

In **l** (final) as in **still**, etc., see fuller explanation under "Notes relative to the Chart."

In **r** (final) as in **for**, **fur**, etc., between the soft palate and dorsum of the tongue with depressed blade.

In **h** as in **her**, **horse**, etc., between the dorsum of the tongue and contracted throat muscles.

EXPLOSIVE ASPIRATES.

The EXPLOSIVE ASPIRATE elements are those which are uttered with a somewhat sudden expelling of the breath, not unlike explosives, as it joins the vocal, though the principal part of the sound is aspirate. The difference between open and explosive aspirates will be recognized in pronouncing **when** and **went**.

The English symbols which represent the "explosive aspirate" elements are **ch**, **f**, **g**, **j**, **l** (hard), **q**, **r**, **w**, and initial **y**. Arranged respectively as regards position and mechanism of utterance they are as follows:

In **w** as in **watt**, **was**, etc., the emission occurs at the lips.

In **f** (initial) as in **few**, **fur**, etc., between lower lip and teeth.

In **l** (initial) as in **late**, **lot**, etc., at the sides of the tongue with the end touching the anterior alveolar ridge.

In **ch** as in **church**, **g** (soft), and **j**, as in **George** and **James**, between the flattened blade of the tongue and the anterior palatal surface.

In **q** as in **quick**, between the dorsum of the tongue and the soft palate.

In **r** (initial) as in **run**, **rat**, etc., same

as the open aspirate **r**, except that the end of the tongue is brought into contact with the palatal surface to start the sound.

In (initial) **y** as in **yet**, **yoke**, etc., between the soft palate and dorsum of the tongue with end depressed.

THE LIPS.

The position and form of the lips in the utterance of a large proportion of the oral elements are quite as important in characterizing the articulate sound as the form, position, and relation of the other organs which enter into the construction of the elements. In this connection it should be remembered that cleft-palate patients or pupils, before operations, have rarely and sometimes never used the lips, the teeth and lips, or the end of the tongue, in a speaking-functional sense; therefore special instruction with the positions definitely defined should be given by the teacher with an insistence that they be fully carried out in their practice, even to a pronounced degree, at first.

Notes Relative to the Chart.

The illustrations under NASALS show the position of the lips and tongue in uttering the oral elements **m**, **n**, and **ng**. They also show the relaxed state of the palatal and pharyngeal muscles which occurs in the utterance of all the nasal elements. Compare this with the closure of the palato-pharyngeal passage in uttering all the other consonants.*

The illustrations under EXPLOSIVES show the position of the oral organs and stops at the *start* of the utterance. Where two positions of the tongue are shown, the one indicates its position at the tip end when the stop occurs to *start* the explosive element, and the other

* The teacher should verify all the muscular positions shown here and elsewhere, in uttering the different oral elements of the consonants, in order to teach the pupil the correct positions by practical instruction and illustrations.

shows the position which immediately follows, to complete its full utterance.

C and **S**. Under OPEN ASPIRATES, the sibilants **c** and **s** consist of a fine sharp whistle, made, as shown, through a tiny opening at the tip end of the tongue. The lower figure shows the contact linguo-palatal area. **Z**, the cognate of **s**, is the same with the addition of vocalization, the vibrations of which can be felt in the throat.

Sh is made by forcibly expelling the breath through a broad thin opening between the retracted end of the tongue and anterior alveolar ridge, with the lips pushed forward as a part of the characterization of the sound. The lower figure shows the linguo-palatal contact.

Ch, J, G. With the EXPLOSIVE ASPIRATE ELEMENTS, **ch, j**, and soft **g**, the second and main position of the tongue following that of the partial explosive is similar to that of **sh**.

L. Note the difference in the mechanism of **l** final and **l** initial. With the former, or OPEN ASPIRATE sound **ul** as

in **full**, the element is *completely* ended, while the end of the tongue rests against the upper alveolar ridge, the vocalized breath escaping at both sides of the tongue; whereas in the EXPLOSIVE ASPIRATE **lũ** as in **lot**, the aspirate part of the element is made in the same way, but is interrupted by a sudden dropping of the end of the tongue to emit the EXPLOSIVE to join the VOWEL ELEMENT. (See illustration on the right showing both positions of tongue.)

R. The OPEN or ASPIRATE part of the sound of **r** as in **bur** is made by forcing the vocalized breath through a somewhat constricted opening at the dorsum of the tongue and on over its concaved surface, the sides and tip being slightly raised. In the explosive aspirate **rũ** as in **run**, the **r** sound is interrupted by the end of the tongue momentarily approaching the roof to produce a more forcible and sudden emission. (See illustration.)

The mechanism of the other oral elements is well shown.

1120 STEWART BUILDING.

CORRESPONDENCE

Pulp Testing.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Having read in the October issue of the DENTAL COSMOS the article by Dr. C. Edmund Kells, entitled "Cureting, Ionization, Pulp Testing," it strikes me that we have in the author a "progressive," but of a unique type.

It is noteworthy in so far that, while the writer presents nothing constructive, he at least attains a useful purpose—that of stimulating or rather exciting discussion upon a matter vital to the progress of dentistry.

I am chiefly concerned with Dr. Kells' disappointing experience with pulp testing, and as an "enthusiastic friend" I

hasten to reassure him of the soundness of his investment, and incidentally set the matter of "dental electro-diagnosis" fairly before the readers of the COSMOS.*

It is inconceivable that one of the analytical and scientific mind, plus the thirty and more years' experience, of Dr. Kells, would jump at conclusions as a result of an experience in testing *one* case. And, judging from the author's description of that one case, it is clear that the tooth checked up correctly, but

* [See the article entitled "Dental Electro-diagnosis" in the present issue of the DENTAL COSMOS, at page 122.—ED.]

that his interpretation was erroneous; as may be seen from rules 2 and 3 in my article on that subject.

For the reason that it is misleading, I take exception to the manner in which the case history given by "enthusiastic friend" is quoted by Dr. Kells on page 892, as follows:

At a clinic all hands agreed that a certain tooth appeared to be devitalized. The pulp tester was applied, and it gave positive and unmistakable signs that the pulp was vital.

It may be interesting for the readers to know that instead of "vital" the term "hyper-plus" was given. Further he quotes:

A skiagraph was then taken, which showed that the roots were filled.

—which in fact read: "Partial root-fill-

ing in the distal root, and an apology for root-filling in the mesial."

The main point, and that the doctor failed to state, was the sequel of that case, namely, "an acute alveolar abscess of the tooth in question, so diagnosed, and the patient warned thereof, at the clinic—five days before the onset."

That case was intended to illustrate to Dr. Kells that a positive reaction to the current not only means a "vital" condition of the pulp, but that it may also signify other equally important conditions.

May I add that I speak from an experience in pulp testing electrically approximately 20,000 teeth.

BERTRAM B. MACHAT, D.D.S.

BROOKLYN, N. Y.

Relation of Caries to Pyorrhea; Symmetrical Caries.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—In my observation, I find that people suffering from pyorrhea alveolaris are generally immune to dental caries. I have seen hundreds of cases of people coming to my office for the extraction of loose pyorrhetic teeth, to find all teeth in the mouth present, with no sign of caries on them except that the enamel has been abraded on the masticating surfaces, due to the wear and tear to which they were submitted for years. What is the relation between these two diseases? Is it possible that the causative factors of one disease have an inhibitory influence on the other?

Also: What causes symmetrical caries of teeth on both sides of the jaw? I find where there are cavities present on any particular surface of a tooth on one side of the jaw, cavities will also generally be found on the same surface of the corresponding tooth on the opposite side of the jaw.

If we accept the chemico-parasitic theory of dental caries after Miller and Williams, dental caries is produced from without, not from within. This being the case, how may we explain this peculiar phenomenon of symmetric dental caries?

I have also noticed that a good number of people have absolutely sound teeth, the explorer not being able to detect the slightest defect, though these people never used a toothbrush in their lives, their teeth being covered with thick layers of calcareous deposits and as dirty as can be.

Where is the truth of the saying, "A clean tooth never decays," when in contrast to the above we find people who are scrupulously clean and careful about their mouth toilets, and are under the care and supervision of the best dental specialists, only to find new cavities in their teeth every three months?

HERMAN AUSUBEL, D.D.S.

BROOKLYN, N. Y.

An Odd Simulation of Lingual Paralysis.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—The following case of "paralysis" seems to me to be of sufficient interest to be reported.

Several days ago a lady drove to the office of my father, who is a physician, with her eighty-five-year-old husband, reporting that he had been stricken with paralysis. The old gentleman was unable to talk, and his tongue was protruded. Upon examination it was found that the sharp root of a lower incisor had penetrated the lower surface of the

tongue while it was in a state of protrusion, and, as the root inclined forward, every effort of the patient to retract the tongue only made matters worse. There was no pain, only a slight burning sensation.

Needless to say, this was a case of "paralysis" that was easily cured even before the cause was removed!

Yours very truly,

E. G. LEE, D.D.S.

CLINTON, N. C.

"A Trouble in Casting Gold Inlays."

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Answering the inquiry from Dr. J. C. Swan of Hastings, N. Z., in the January issue of the DENTAL COSMOS, page 70, regarding trouble in casting gold inlays, I respectfully submit the following remedy for his difficulty:

A sprue not less than one-fourth inch

long and of approximately No. 20 gage, having the casting metal thoroughly melted but not overheated, and casting with five pounds pressure in a mold that has been allowed to cool to below red heat.

L. M. FARNUM.

PHILADELPHIA, PA.

PROCEEDINGS OF SOCIETIES

Pennsylvania State Dental Society.

Golden Anniversary Meeting, held at Wilkes-Barre, Pa., April 23-26, 1918.

TUESDAY—*Morning Session.*

THE Pennsylvania State Dental Society celebrated its golden anniversary at Wilkes-Barre, on April 23, 24, 25, and 26, 1918.

The president, Dr. C. S. Van Horn, Bloomsburg, occupied the chair, and called the meeting to order at 10.15 A. M.

Rev. SELDON L. HAYNES invoked the divine blessing on the deliberations of the society.

The audience then rose and sang "The Star-Spangled Banner," being accompanied on the magnificent organ of Irem Temple (the place of meeting) by Mr. John H. Shepherd, organist.

The President introduced F. P. SLATTERY, Esq., Wilkes-Barre, who welcomed the society to the city.

Dr. W. A. SPENCER, Carbondale, responded to the address of welcome.

The PRESIDENT. You will all be delighted to know that we have with us this morning two of the charter members of the society, two of those valuable men who had the courage of their convictions, and have always stood for the uplift of dentistry, and who always will stand for it. With quite considerable effort we prevailed upon these two charter members to come up on the platform, and I will call on them in the order in which their names appear in the Con-

stitution, to say a few words to you. First we will hear from Dr. Scholl.

Dr. W. H. SCHOLL, Reading. *Gentlemen of the society*.—This is an unexpected call. I am not prepared to make an address, and as there is a man here who is more able to do so than I am, I will let him have the opportunity.

The PRESIDENT. The next gentleman we will hear from is Dr. William H. Trueman.

Dr. WM. H. TRUEMAN, Philadelphia. It certainly gives me a great deal of pleasure to meet with you on this occasion, the fiftieth anniversary of the Pennsylvania State Dental Society. Looking back it seems but a very short time since a few met together in Philadelphia and organized this society, although looking forward fifty years seems a long time. What has been accomplished in that time? When that convention met the profession was unorganized; today it is thoroughly organized. Then there were no standards in the professional schools; now we have a very high and constantly rising standard. What the future will bring forth—who can tell? I am very glad I lived so long as to meet with you on this fiftieth anniversary. Lines have fallen with me in very pleasant places, and I look forward to being with you at future meetings with a great deal of pleasure.

The vice-president, Dr. Spencer, then took the chair, and Dr. C. S. VAN HORN,

Bloomsburg, read the Annual Address of the President, as follows:

President's Address.

By C. S. VAN HORN, D.D.S., Bloomsburg, Pa.

Fellow members of the Pennsylvania State Dental Society.—In causing the President's Annual Address to be published in the *Bulletin*, I am carrying out, in part, a plan of presenting and disposing of a more or less important item of business in a manner which seemingly has some merit.

Under the régime which has prevailed in the past it was customary to appoint a committee (usually of three) to report on the President's Annual Address. I feel that proceeding in that manner is liable to inefficiency in results and a probable cause for confusion, for the reason that the members of the committee have not had an opportunity to see the address prior to its presentation at the meeting, and in consequence, concentration and judicious thought and action are not so liable to obtain when the address must be considered and reported upon during the annual meeting.

As a possible improvement the following tentative plan is suggested: (1) That the President's Annual Address be published in the official organ of the society at least thirty days prior to the annual meeting. (2) That the committee to consider the address be a *fixed* committee and composed of the chairmen of the following standing committees—Publication, Ethics, and Legislative. (3) That this committee make their report either immediately after the presentation of the address or through the Council. (4) That the President's Annual Address be presented, according to program, either by title, in part, or in full, at the discretion of the society.

The advantages which seem to accrue from a procedure of this nature appear manifold and in part as follows: Any matter that may be considered by the committee advisable to refer to the society for open discussion would receive more intelligent consideration by reason of the fact that the discussion could fol-

low, in effect, immediately after the address and the committee's report; it would give the committee and the members ample time to privately study the address and ponder the contents; it does not impose a more or less difficult task upon a rather vital committee at a time when they, by reason of the literary program and other interests and duties, can least afford the expenditure; and finally, it seems to embody both efficiency and safety.

This meeting marks the close of the first half-century of organized dentistry in Pennsylvania, in the United States, in the world. We do not wish to imply that the birth of organized dentistry occurred throughout the world in A. D. 1869. We do not affirm that the Pennsylvania State Dental Society represents the first effort by dentists of Pennsylvania, or the United States, to establish an organization of dentists. The specific time or place of that birth is relatively unimportant; the important consideration, as viewed by your president, is the reason for that birth and the development of the child.

Whereas, the dentists of the State of Pennsylvania, actuated by a desire to elevate the standard of the dental profession and a conviction of the many advantages to be derived from literary and scientific institutions, have associated themselves under the name and title of the State Dental Society of Pennsylvania; and

Whereas, the objects of this society are to advance the science of dentistry, and thereby to lessen human misery by investigating the diseases incident and remedies applicable to the human mouth and its dependencies; by observing and recording the changes produced in dental maladies by the progress of the arts, population, manners, and customs, temperament, age, and sex; by searching for and applying the various remedial agents to be found in the several kingdoms of nature; by enlarging the avenues of knowledge from observations, discoveries and inventions, both at home and abroad, and by cultivating order and uniformity in dental practice; and

Whereas, the said State Dental Society have prayed us, the representatives of the freemen of the Commonwealth of Pennsylvania, that they may be created a body politic and cor-

porate forever, with such powers, privileges, and immunities as may best answer the laudable purposes which the members thereof have in view, wherefore, to assist and encourage the said State Dental Society of Pennsylvania in the prosecution and advancement of useful knowledge for the benefit of their country and mankind. (*Extract from Charter-Constitution.*)

Organized dentistry may be defined succinctly, if not altogether elegantly, as an institution regulated by law to establish laws which protect *the people*, that they may receive unimpaired, unfettered, and unembellished all of the combined efforts of all the dentists of all countries for all time.

Organized dentistry was established upon the broad principle of *service*. It is democratic, and is *endeavoring* to be scientific to the extent of attaining the ideal—*the elimination of the need of dentists*.

Prior to 1906 canned, bottled, and packaged food, drugs, etc., were purchased in the open market by the people, who largely have a childlike confidence in the integrity of those with whom they are dealing. It is common knowledge that much of the food, drugs, etc., which were then sold were adulterated, impure, preserved(?) or what not, not only to the extent of fraud, but in many instances to the detriment of the health of the consumer.

Today, by virtue of an Act of Assembly, food, drugs, etc., must be properly and legibly labeled according to a fixed standard of purity, etc. And though it be true that this act is circumvented by some "little Americans," in the main it is a broad step, by our Government, in *one* direction in safeguarding the people against fraud, and, if you please, disease.

Organized dentistry was established for a purpose quite analogous to that of our Pure Food and Drugs Act, together with its governmental accompaniment, viz., the Bureau of Agriculture.

A few broad-minded men with vision realized that dentists are human; that "The human mind was organized and de-

veloped to think of the individual, and not of the species—the race" (Wells); that "The human race, though a gregarious race, has ever been and still is a predatory race" (Spencer); that rising above our environment is dependent largely upon exercising our gregarious tendencies; that the character of advance depends upon the attitude of mind, acquired or otherwise, of the flock; that if dentistry is to occupy a position of any prominence and the dentist command the respect and confidence of his *clientèle*, dental activities must be directed toward an unpredaceous effort in solving pathologic and other dental problems, and that this knowledge, attained largely through scientific research, be broadly disseminated and utilized as a safeguard against both fraud and disease.

As yet our Government has not established a department devoted to investigations directly connected with or interested in the solution of the problems which we as dentists are endeavoring to solve. *Agriculturally* we are quite well cared for; our soil receives governmental consideration; tree and plant life is studied and the bugs, pests, blights, etc., inimical to *their* health and proper development are formidably dealt with. The farmer's pig receives vastly more governmental attention than does his child. Whether that be wise or otherwise is outside the question at this time. The fact remains that we (as dentists) are dependent upon our allies and ourselves for dental knowledge contributory to public health.

Organized dentistry, realizing that efficient dental service cannot be correctly defined as mere "tooth carpentry;" that individual effort unassisted, is laborious, trying, expensive; is in many instances incomplete and in some cases crude, established the Research Institute of the National Dental Association, an institution in which you and I should be most vitally interested professionally, morally, and *financially*. For the purpose of this department, whose ramifications are unlimited in purpose and in area, is to consider *human* life

and the "bugs, pests, and blights" inimical to the health and proper development of the human race.

I feel that organized dentistry has accomplished much, very much, in the past half-century, and yet—how little! An acute vision is not required to see lamentable ignorance of some of the most vital problems with which we are confronted, and which, it is reasonable to assume, would have been solved ere this had it not been for the fact that we have failed to realize the absolute necessity of properly and adequately financing scientific research.

There are 43,000 dentists in the United States; there are 4000 in Pennsylvania. The National Dental Association has a membership of 20,000; there are 1400 members in the Pennsylvania State Dental Society. Is there any logical reason why only 35 per cent. of the dentists in Pennsylvania are affiliated with the State Society, and less than 50 per cent.* of the dentists in the United States in the National Association? Yes! and the reason is readily traceable to lack of interest in and failure to recognize the universal benefit of organized dentistry, its purpose, and its ambitions.

Until recently the object of Government agricultural activities was directed along the line of least resistance in so far as the department was concerned. Quantities of money and much honest effort were expended in experiment station work, and in consequence vast quantities of most useful knowledge amassed and put into cold uninteresting (?) type by the Government printing office for the beneficent edification—the abolition, if he had realized it—of the farmer. Result: The useful—and it was and is useful—knowledge thus disseminated was largely, very largely, utilized by the farmers' governmental constituents as a means of advising the home folks that, "Please observe I am in Washington, D. C., attending to the business which you intrusted to me." And as to the farmer: The bulletins issued by the

Government to the farmer through their representatives were about 90 per cent. wasted energy until direct agricultural representation in the form of farm agents was instituted. These men, "experts in their line," go directly to the farm, and tell the farmer the *how* and the *why* for various modes of procedure. And, since that *how* and that *why* conduce to a bean and a half where but one bean grew before, the farmer realizes the advantages which accrue from "listening," and finally acquires a disposition to dig into the theory with a mental energy in relative proportion to the physical energy which had formerly been expended in agitating the soil and garnering, in most instances, a meager crop.

What organized dentistry has been and is now endeavoring to accomplish is—The dissemination of information; educating (a) the dentist in matters relative to rendering efficient service, and (b) educating the public to a realization and an appreciation of efficient dental service. Furthermore, organized dentistry is endeavoring to eliminate the need of dentistry rather than creating a demand for dental service. It is not concerned with either wages or hours per day, those items are for the individual to contemplate, adjust, and regulate.

Whenever the public arrives at the stage of intelligent discrimination, and dentists realize the absolute necessity of a harmonized organization of *dentists* as well as of *dentistry*, we shall be in position first to suggest, and then, if necessary, dictate legislation, which will, in so far as a democracy will allow, protect, possibly assist, the interests which are deeply concerned with the public in the way of its health, happiness, and *usefulness*.

Each dentist in our State Society is a cog in *one* of the wheels of a machine (national in character) which, by reason of the fact that there are insufficient cogs in *all* of the *wheels* of this machine, is working under adverse conditions.

In view of the consideration that the National Dental Association is looked to for and is the natural source of efficient research work; that research costs

* Figures and per cent. approximate.

money (time and apparatus); and that the only source of revenue at present is obtained through organized dentistry, it has occurred to many of the members of this society to carry out the complete plan promulgated during the recent re-organization movement. A plan which not only organizes *dentistry*, but *dentists* as well.

Perhaps it has not occurred to you in that way before. Perhaps you have looked upon organized dentistry as organized dentists. It is not! At least it does not always follow that organized dentistry carries with it in truth the implication that the dentists are organized. A membership of 1400 in the Pennsylvania State Dental Society out of 4000 dentists in Pennsylvania seems sufficient to eliminate the presumption that "The dentists of Pennsylvania are organized."

It occurs to me that we have not altogether justified the confidence of the broad-minded Pennsylvanians who laid the very substantial permanent foundation upon which we are supposed to build. We have not in the past half-century improved our system of society government and activities in relative proportion to the strides in operative technique, or to comply with the advance in organization generally, and scientific tendencies especially.

Our present charter-constitution in granting the *legal* right to organize for the purpose of "enlarging the avenues of knowledge" defeats, in part at least, the main consideration, by imposing a combination of conditions both too legal (parliamentary) and too democratic. Your president has not the slightest objection to a democratic form of government, provided it be constructed and constituted to operate without too much lost motion or friction. "One of these" [business men in contradistinction to Congress] "needed a certain commodity to continue in the manufacture of an essential in our war business—a vital ingredient. He discovered that a supply was obtainable and secured it. Soon after he was called to task by a Government official for his action. . . .

'I am sorry,' said the business man. 'I regret that I erred through ignorance of the official precedents and requirements and dignities, but here's the material!'"

Our society Charter-constitution and By-laws assume, I infer, that "all men are created equal"—to which I do not object—and being equal must be bound together and intricately interlaced with vast quantities of red-tape in order to maintain equality and dignity in our official procedure—to which I do object, and for the very simple reason that red-tape only emphasizes the "E"-go in equality and usurps the "dig" from dignity—It doesn't conduce to—"Here's the material!"

The present—not to mention future—size, status, and ambitions of the Pennsylvania State Dental Society, coupled with the volume of criticism which has come to me from all parts of the state, indicates that the Constitution and By-laws under which we are endeavoring to operate are not eminently fitted for the purpose for which they were designed.

In consideration of the above and the further fact that "The great purpose of all rules and forms is to subserve the will of the assembly, rather than to restrain it; to facilitate, and not to obstruct, the expression of their deliberate sense," I have solicited the views of many members of the society respecting the *advisability*, the *manner*, and the *method* of making changes; and as a result of that canvass have come to the conclusion that the Constitution and By-laws of the National Dental Association, revised to meet State Society conditions, would tend to cover the requirements of our corporation as an *educational institution* and, at the same time—possibly—be instrumental in increasing the number of stockholders. Parenthetically: Have you ever considered—even superficially—that the Pennsylvania State Dental Society is a *corporation*? It might be profitable to you 1400 stockholders (members in the society) to do some thinking along that line, and, incidentally, compare the management of *your*

corporation with the manner in which successful commercial corporations are run, keeping in mind that while the dividends which you receive are in the form of *efficiency in services rendered to your clientèle*, it nevertheless requires financial backing to keep *any* corporate interests moving.

The Constitution and By-laws of the National Dental Association possess liberality and saneness without being either too democratic or excessively autocratic. They make possible the conduct of both official business and professional activities at any time or place advisable or desirable, and in a manner refreshingly salutary to the interests involved.

Direct voting is *in degree* eliminated—thus utilizing to advantage the time which is now spent by the society in going through the form of sanctioning the action of the Council; and that is the sum-total of the *grave* importance of our annual election—gracefully side-stepping, in so far as possible, the rules and forms dogmatically stipulated under Article III. All official business is officially transferred to a *legalized* official body of the society—the Council, which is *elected* from the membership of the component societies by their members at their annual election.

Your President is of the opinion (which is amply corroborated by the manner of our official procedure for the past several years) that *all* of the official business of the Pennsylvania State Dental Society may *safely* and *very wisely* be left entirely to a body elected by our component societies: And especially does this form of procedure seem equable and desirable in view of the fact that it not only takes cognizance of representation in proportion to membership (majority rule), but actually and without lost-motion assures the full time of our annual meetings for deliberations conducive to dental advancement—deliberations in which professional activities generally, and public interests especially, are vitally concerned. Studying pathogenic “bugs” should be of more interest to the members who attend the meetings of

the Pennsylvania State Dental Society, than exercising austere parliamentary bees.

The *how* and the *why* of an official election, or ponderous resolution, or what not, is relatively inconsequential provided it does not intrude upon the *how* and the *why* of, let us say, root-canal procedure.

The character or efficiency of a Constitution and By-laws is of no more usefulness, *per se*, than is an easy riding, flexible, efficient automobile minus gasoline in the carburetor. It seems to me that dental organizations generally might improve their efficiency and increase their membership by adopting a plan similar to the present régime of the Agricultural Bureau, as previously outlined, viz, instead of depending upon cold type, send experts in their line directly to the dentists.

This thought was anticipated by President Bratt (1909), and tacitly expressed by Secretary Weaver (1916) when, in tendering his resignation, he said:

I suggest that you read Dr. Bratt's suggestion in the proceedings for 1909. This contemplated the working out of a scheme by which, if properly handled, we could have a permanent dental secretary for the state. The time is at hand when we need one badly, both for the interests of the State Society and the interests of the profession in Pennsylvania.

This can be accomplished by the selection of a secretary—not myself—of the State Society; retain him on the Committee for Enforcement of the Dental Law (salary to remain as now, \$800 per annum), elect the same individual to the Examining Board, with the understanding that he be elected its secretary, with authority as to registration and enforcement of the law as now, his compensation to be sufficiently increased so that his total salary or compensation should be \$2500. This would warrant the right man in spending sufficient time in visiting the local societies, working up new territory to organize other component societies, and in general further the interests of the profession and of the State Society. I reiterate that the time for such a move is here.

With the possible exception that the State Board appointment (being so un-

certain) should not be considered imperative—but rather as merely desirable at least for the first few years—the Bratt-Weaver plan appears to be the most logical suggestion yet made for placing Pennsylvania Dental Society activities upon a rational basis. “The right man” selected and continued so long as he satisfactorily performs the duties imposed, together with whole-souled co-operation, would accomplish much in the way of organization and for humanity, and in addition to performing the duties as outlined, a permanent secretary could easily relieve the standing committees of much arduous work and anxiety. President Seip (1914), one who has had as much experience in working up dental meetings as any other individual in Pennsylvania, and who always produces results far above the average, writes as follows: “If such a man could be obtained, and could act as secretary and manager of our annual meetings, he would earn his salary whatever it might be, and would take a lot of detail work off the shoulders of the men who usually do these things.”

You who have been actively engaged in the committee work of dental meetings realize the pertinence of that statement just as fully as you who have given the question of membership any thought are aware of a tendency toward a lethargic condition. In this connection may I use the following example, pointing out that the condition is not *peculiar* or indigenous to the locality:

This is the Fiftieth Anniversary of the Pennsylvania State Dental Society; coincidentally it is my twenty-fifth anniversary. Since graduation (1894) I have been practicing in Bloomsburg, and in that time not a single dental meeting has occurred in either Columbia or Montour county; not a lecturer or clinician or interest-booster has come to show us any improved methods or arouse our curiosity. In these two counties we dentists are not even snoring with sufficient vigor to attract attention, for the simple reason that neither National, State, nor component power plants have yet developed enough sound-waves to rouse us.

You cannot rouse somnolent dentists by bathing them in printer's ink any more effectively than the Government awoke the farmer by flinging bulletins in his face. Human nature's opsonic index indicates that the bug must be injected direct—even then it sometimes does not “take.”

It is a cold-blooded proposition, but nevertheless a fact, that the development of man's knowledge bump depends very largely upon the *visible* effect which that development may have upon his belly or his pocket-book.

The American Indian developed a sizable bump in the direction of arrow-head manufacturer as a food proposition, etc. Present-day farmers are developing a bump which conduces to an extra half bean as a means of acquiring an automobile. Dentists acquire, through the medium of our colleges, a bump sufficiently prominent to pass the State Board inspectors. And “that reminds me”: Does the State Board examination include inquiry into what preparation the applicant has had as to his future education? his knowledge of dental society activities? his inclination toward contributing to their literary and financial support?

As viewed by your president, dental societies are Postgraduate Schools of Dentistry, and, naturally, membership (the student body) is directly dependent upon (a) What the school has to offer, and (b) Making known to all prospective students the character, purpose, and ambitions of the school. Many dentists throughout the state would very gladly affiliate with our society if they realized what they are missing; if they realized that all dental art, science, and literature—all advancement—emanates from society activities.

The American Red Cross needed assistance—and *got it!* by going directly to the people, stating concisely what was wanted, why it was wanted, and what was to be done with it. And do not forget they *got it* and are *getting it* and will *continue to get it!* The National Dental Association needs assistance, and for a similar reason and purpose. Every dentist in the State of Pennsylvania

needs, whether he realizes it or not, organized dentistry. Organized dentistry needs every dentist in the State of Pennsylvania, whether we realize it or not!

This address is not a one-man affair; it pretends to no individuality, nor is it tinctured with whims, pet theories, or innuendo. It endeavors by precept and example to lucidly portray conditions, and in considering remedies takes cognizance of former addresses and of their disposal. Its slogan is:

Organization more abundantly, with frictionless efficiency;

Whole-hearted co-operation in *professional* and *public education* as a means of eradicating disease causation;

Love, loyalty, liberality, and *sincerity* in all professional activity.

Dr. V. S. JONES moved that a committee be appointed to consider the President's Address, and to report at a later session. (Motion carried.)

The following were appointed as such committee: G. S. Schlegel, W. D. DeLong, and W. H. Fundenberg.

Dr. Van Horn then resumed the chair.

The PRESIDENT. In consideration of the fact that the President's Address has been passed, I take this opportunity to thank you for the honor you have so courteously bestowed in selecting me to preside at this meeting. Presiding at any annual meeting of an organization of such prominence is no small honor, but to be selected as the presiding officer of the fiftieth annual meeting carries with it, in my judgment, a special privilege, for which I assure you I am truly grateful. If this meeting is a success, —and it has the earmarks of being so, especially in so far as the arrangements are concerned—it is due entirely to the several committees who have had charge, and who have worked unceasingly to perfect the machine in its individual parts, and as a whole. If there is one thing which will stand out most prominently and persistently in my memory and make reminiscence an unalloyed pleasure, it will not be that I was the

president, it will not be that the meeting was a grand success, but it will be that my association with the Advisory Committee was the most pleasant experience I have ever enjoyed. These men, individually and collectively, knew how to work, and knew why they were working. There was no ego, no self-aggrandizement, and no prejudice. Self-reliance, ability, and sincerity characterized their every thought and action. They are the men who carried the burden, and to them belongs the credit.

The next order of business is the reading of the minutes.

Dr. BIDDLE. As the minutes have been printed in full in the Transactions, I move that they be approved as printed. (Motion carried.)

REPORT OF THE SECRETARY.

Dr. J. F. BIDDLE, Pittsburgh, then read his report as secretary, as follows:

During the past year the active membership list of the Pennsylvania State Society has been depleted by one hundred and forty-seven members who have entered the United States service, but it seems fitting that their names be carried upon our membership, without payment of dues, so long as they remain in active service. Furthermore, a resolution should be adopted requesting the National and the component societies of the State Society to take similar action.

Of the eighteen component societies of the Pennsylvania State Dental Society, fifteen have forwarded financial statements to the secretary, with an aggregate paid membership to date of 940. This membership is considerably lower than last year, which is readily accounted for by reason of the war, and also, to judge by reports of component secretaries, by the increase in yearly membership dues.

The secretary would suggest that on account of the increased cost of printing, difficulty of securing labor, and congested condition of mails, that during the period of the war, the *Bulletin* of the State Society be issued semi-annually, instead of quarterly, as has been our custom, one *Bulletin* before, the other subsequent to, the annual meeting.

On motion of Dr. FRIESELL, Pittsburgh, the report was received and adopted.

Dr. O. J. SPECKER, Reading, corresponding secretary, reported that all the correspondence which had come to his hands had been attended to. On motion, the report was accepted.

Dr. A. B. MILLER, Kingston, read the Treasurer's Report.

Dr. GILL moved that the report be accepted as read, and that auditors be appointed. The motion was carried, and the President appointed Dr. Seip, Dr. Knox, and Dr. Friesell as auditors.

Dr. A. E. Bull, Wilkes-Barre, chairman of the Program Committee, reported as follows:

Dr. BULL. The program will be presented as printed, with one exception. Dr. Ash, of the Preparedness League, will not be present, on account of illness, but has sent in his place Major Heckard, who will give a lantern exhibition. All the committees who compose the Advisory Committee in the preparation of this program hope the members of the society and their guests will enjoy a profitable meeting.

A motion was made to receive the report. (Motion carried.)

Dr. J. F. BIDDLE, Pittsburgh. The Publication Committee present as their report the printed proceedings, which I think every member of the society has received.

On motion, the report was received.

Dr. A. E. BULL, Wilkes-Barre. The Committee on Ethics has no report other than that they have received no communications, nor have they held any meetings since the last annual meeting. In looking over the By-laws, the duties of the Committee on Ethics are very plainly stated; but in looking over the proceedings since 1893, I find only one report of a Committee on Ethics, and that consists of two lines. In view of that fact, I would like to ask the question, "Why a Committee on Ethics?"

The PRESIDENT. I think we may pass that report, and place it on the minutes without a motion.

REPORT OF COMMITTEE ON NECROLOGY.

Dr. WILLIAM H. TRUEMAN, Philadelphia, chairman of the Committee on Necrology, read the following report on the death of Dr. Elihu Roberts Pettit of Philadelphia, a charter member of the society.

Dr. Elihu Roberts Pettit.

The Committee on Necrology reports with sorrow the death, at Philadelphia, October 4, 1917, of Elihu Roberts Pettit, D.D.S., a charter member.

Dr. Pettit, son of Joseph and Caroline Pettit, was born at Salem, N. J., February 28, 1842. He was graduated by the Pennsylvania College of Dental Surgery, Philadelphia, February 29, 1868. He located in Philadelphia, and soon acquired a satisfactory practice. He was an excellent workman, pleasant and affable, progressive, and yet conservative in keeping his methods of practice well up to date.

He early felt the need of something to lessen the fatigue associated with dental operations. This led him to consider the use of the electric current and electric motors. Battery currents were, at that time, the only source available. He invented a new battery, less expensive in first cost and to operate, and more satisfactory in use, and improved the electric motors then in use, making them more satisfactory for dental purposes. The rapid advances in electrical science, especially the introduction of storage batteries and the commercial electric current, soon established a new era in transforming electric energy into motive power, and these improvements were lost sight of. They were a step, however, toward the very useful electric-driven dental and surgical engines that have done so much for surgery and dentistry.

Dr. Pettit for many years was active in dental society work, serving as secretary to the Pennsylvania Association of Dental Surgeons for a long time, and was appointed by that society a delegate to the convention that organized the Pennsylvania State Dental Society, and became one of its charter members. He was in active practice fifty years.

He is survived by his widow, Mary Deshong Cooper, daughter of Thomas Cooper of Philadelphia, two sons, Clarence C. and Thomas D., and one brother, Dr. Joseph Pettit of Philadelphia.

WM. H. TRUEMAN, *Chairman,*

W. H. SCHOLL,

C. C. WALKER.

Committee.

The report was accepted as read, and ordered to be spread upon the minutes.

REPORT OF DENTAL EXAMINING BOARD.

The report of the Dental Examining Board was read by Dr. A. H. REYNOLDS, Philadelphia, as follows:

The Dental Examining Board has had two regular examinations. The one in June was unusually large. Owing to the fact that we were the first in the country to hold an examination, many took advantage of the same, and applied for examination for admission to the Reserve Corps.

The Dental Council declined to admit the graduates of the Louisville School, the Jersey City College, and George Washington University.

I also had the pleasure of being a member of the Dental Educational Council, of which Dr. Friesell is a member from the Faculties Association. That Council went over all the colleges in this country, and classified them as A, B, or C, defining what each would be. That work was sanctioned by the United States Government, and they detailed army officers to attend the meeting of the Educational Council. The graduates of "C" colleges will not be recognized for commissions in the army or navy, practically putting those colleges out of business. The students will have to attend other colleges.

On motion, the report was approved as read, and ordered spread upon the minutes.

Dr. A. J. HEFFERNAN, Wilkes-Barre, reported that the Committee on Local Arrangements had nothing further to report, except that everything was in readiness for a successful meeting; also that the reports had been published in the quarterly bulletin.

On motion, the report was accepted as read.

Dr. C. R. SCHOLL, Reading, read the report of the Committee on Dental Science and Literature, as follows:

REPORT OF THE COMMITTEE ON DENTAL SCIENCE AND LITERATURE.

The Committee on Dental Science and Literature submits its report as follows:

Communications, bibliographical, historic, and inventions, appearing in the dental journals since the last meeting of our society: This work to be complete and of value should have the care of one with a literary qualification, one who has access to *all* the works relating to our profession; your committee lacks both.

We would again urge the members to subscribe to the dental journals, peruse their pages, and "observe—compare—reflect—record" their contents.

The editorials of the journals are all interesting and worthy of careful reading.

The articles on oral hygiene from the adept pen of John Phillip Irwin, D.D.S., are to be commended for their helpful talks to our juvenile patients in arousing their interest in things hygienic. We would suggest their use when examining groups of children in school clinics or elsewhere.

* * * * *

It is worthy of note that nearly fifty per cent. of the patents granted during the last nine months have been for artificial teeth and prosthetic appliances, for toothbrushes twenty per cent., and for prophylactic appliances about thirty per cent.—a healthful sign of the thought along lines of preventive dentistry.

Respectfully submitted,

C. R. SCHOLL,
Chairman.

On motion, the report was accepted as read.

REPORT OF THE COMMITTEE ON ENFORCEMENT OF THE DENTAL LAW.

Dr. A. H. REYNOLDS, Philadelphia, presented the following report of the Committee on Enforcement of the Dental Law:

The Committee on the Enforcement of the Dental Law, in submitting the following report, desires to call attention to the fact that a large part of the work during the past year has been done in the western part of the state, which heretofore has not received as much attention as the eastern part.

The committee desires information relative to the illegal practice of dentistry on the part of anyone, but cannot always send someone immediately to make the investigation, particularly if the case is located in some of the more inaccessible parts of the state. Otherwise the fund would be used up on one or two such cases. We have endeavored to arrange the cases so that the investigator can cover several in one trip.

The committee have had many cases reported for illegal practice and failure to register investigated, have had some convicted and fined, some held for court, settled some cases out of court, and in many cases found there was no evasion of the law. The committee have investigated over forty cases in Philadelphia, four in Allentown, three in Bethlehem, three in Williamsport, two in Harrisburg, two in Easton, one in Reading, two in Pittston, one in Gouldsboro, two in Scranton, two in Chester, one in Christiana, two in New Castle, two in Renovo, two in Punxsutawney, one in Kersey, one in Beaver Falls, one in Beaver, one in Darlington, one in Meadville, two in Erie, two in Windber, one in New Bethlehem, and a number in Pittsburgh.

ANNUAL REGISTRATION.

The financial report of the money received from the registration fee and expended by the board is presented herewith. This shows the receipt of \$4220.18 during the year, with the expenditure of \$3173.42 for the expense of registration, which includes postage, printing, clerical services, court costs, detectives and lawyers' fees, leaving a balance of \$1046.76, which is deposited in a savings bank to the credit of the board, in the event it becomes necessary to secure additional legal talent to carry any contested case to the higher courts.

Several inquiries have been received lately relative to the use to which the registration fee is applied, and the board desires to emphasize the fact that the members do not receive any remuneration from this fee except for actual service rendered. With the exception of the cost of postage, printing, clerical work, etc., the entire amount is devoted to the enforcement of the law against the illegal practice of dentistry, which was formerly borne by the State Dental Society. The act puts the expense on the entire profession of the state, instead of the members of the State Society only, as formerly.

The committee has endeavored to be as economical as possible in the administration of this fund, and if they have failed to investigate certain cases it has been on account

of the heavy expense it would be necessary to incur in sending a man to some of the more remote parts of the state to investigate a single case.

The work of the secretary's office has been unusually heavy this year, as we sent out nearly 14,000 pieces of mail during the year, received approximately 8000 letters, furnished certificates to the candidates who applied for commissions in the Dental Reserve Corps, and answered many telephone calls and saw a great many callers relative to the dental law, the question of registration, and the illegal practice of dentistry. The investigations of the cases reported for illegal practice in the eastern part of the state have also been directed from this office.

The list this year is not as large as last year, owing to the fact that it was agreed among the various boards, at the request of the Dental Committee of the Council of National Defense, that the dentists in active service in the army and navy should not be required to pay the annual registration fee. This agreement has been carried out in this state, and in many cases the fee returned to the applicant, with the information that he did not have to register until he returned to active practice.

[Followed by the financial report.]

On motion, the report was accepted.

Dr. H. E. FRIESELL, Pittsburgh. The Legislative Committee has no report to make at this time.

On motion, the report was accepted.

The PRESIDENT. The Committee on Oral Hygiene and Public School Dental Education has handed in a report through Dr. Fundenberg. Dr. McFadden regrets that he could not be here. Dr. Biddle has just gone through the report, and states there is nothing in it of vital interest at this time. There are some things to be taken up by the Council, and therefore I would suggest that we accept the report, and that it be printed in the proceedings.

The report was accepted.

REPORT OF COMMITTEE ON ORAL HYGIENE AND PUBLIC SCHOOL DENTAL EDUCATION.

At the last annual meeting of the Pennsylvania State Dental Society in Philadelphia the Committee on Oral Hygiene and Public

School Dental Education had a moving-picture machine demonstrated to them.

All were so favorably impressed with the possibilities of this machine (the Pathscope) that the committee unanimously recommended the purchase of a pathscope. The officers of the Pennsylvania State Dental Society placed five hundred dollars subject to the order of the Committee on Oral Hygiene and Public School Dental Education.

After further investigation of the pathscope the committee found there were no suitable moving-picture films available. There were a number of moving pictures suitable for this work, but all were made for the Standard machines, and nearly all controlled by the Standard film manufacturers or by individuals who were so tied up with the film manufacturers that we could get no action.

After an unsuccessful attempt to get the National Dental Society Committee to take the lead in this movement, we opened negotiations with the Pathscope Co. relative to producing and copying suitable moving and still pictures for the work.

They have made us a proposition to print moving-picture films and still pictures for the pathscope at their regular price: "Ten cents per standard foot if the copy is made direct from the negative. If, however, the negative cannot be furnished, and if the Pathscope Co. have to make a copy from a Standard positive, the price would be seventeen cents per foot." They would place these pictures in their exchange, and give us one-half the amount received for rentals.

We have succeeded in getting the privilege of copying the moving picture "Toothache," either for the Standard or the pathscope machine, and the privilege of selling or renting these copies. The only consideration to be, one copy of the picture in the Standard film for the private use of the National Mouth Hygiene Association.

We expected to have a copy of this moving picture, "Toothache," and a series of still pictures suitable for an evening's entertainment ready for this meeting, but we found the Standard film we were to copy from was too much worn to make a good copy. So we have postponed it, with the hope that we can find a good copy of this picture, or that we can find other pictures suitable for this work that are not tied up by some individual or the Standard Film Co.

We are still very enthusiastic over the possibilities of the pathscope for educational work, and recommend that the new committee investigate.

The Pennsylvania State Health Exhibit is anxious to get the dental pathscope films, and to co-operate with the dental profession in this educational work. We recommend that they be furnished with an outfit suitable for this work. They have been using for the past year films and slides belonging to the Odontological Society of Pittsburgh. Dr. Wm. C. Miller reports that the pictures have been used extensively, and are very valuable in this health work. He is anxious to continue using them, and to co-operate with the dental profession in the health education.

While I personally took the privilege of allowing Dr. Miller to use these pictures of the Odontological Society, I felt that the State Society would back me up in this movement, and willingly reimburse the Odontological Society for the use of these pictures. Since Dr. Miller is anxious to continue their use, I recommend that the State Society purchase their pictures and co-operate with Dr. Miller in their use throughout the state.

Respectfully submitted,

T. W. McFADDEN, *Chairman.*

On motion the report was accepted, and ordered printed in the Transactions.

The Committee on Registration reports that Dr. Matten is registering the members as they come in.

The President invited the first and second vice-presidents to attend the meetings of the Council.

The meeting then adjourned until 2 o'clock.

TUESDAY—*Afternoon Session.*

The meeting was called to order by the president, Dr. Van Horn, at 2.15 o'clock.

Vice-president Spencer took the chair.

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

Dr. G. S. SCHLEGEL, Reading, read the report of the Committee on the President's Address, as follows:

The undersigned committee appointed by the first vice-president to consider the Address of the President beg to submit the following report:

The innovation of publishing the annual

Address of the President in the quarterly *Bulletin*, the official organ of the society, meets with our hearty approval, and we recommend that the by-laws of the society be amended to make it obligatory upon all future presidents to publish their annual addresses in the *Bulletin* not later than thirty days prior to the annual meeting.

The suggestion of the president to have a fixed committee to discuss the President's Address, namely, the chairmen of the Committees on Ethics, Publication, and Legislation, does not meet with our approval, because this would really resolve itself into the president appointing the committee to discuss his own address. The power of the first vice-president, whose duty it has been to appoint this committee, should not be usurped. If there be any virtue in the appointment of the above-named chairmen to serve on this committee, the first vice-president should appoint them.

The address, although printed in full in the *Bulletin*, should be read in full at the annual meeting.

The discussion of the annual address should take place immediately after the reading of it by the president.

We wish to recognize with the president the utter indifference on the part of so many of our dental brethren to the fundamental functions of organized dentistry and the organization of dentists.

We most earnestly recommend a change in our Constitution and By-laws whereby the governing power of the State Society shall be vested in a House of Delegates, who shall be elected by the respective component societies, the number of representatives to be in proportion to the membership of the component society. This body will take the place of the present Council. We recommend the appointment of a committee to draw up such amendments as would be in harmony with this plan, and present them not later than Thursday of this session.

We cannot indorse the Bratt-Weaver plan of having the secretary of the State Society serve as chairman of the Committee on Enforcement of the Dental Law and be elected to the State Examining Board, with the understanding that he be made secretary of it, and by virtue of this office be given the duties (clerical) of registering all the dentists in the state.

The committee recognizes the harmony of the three positions as outlined, and believes beyond a doubt that increased efficiency would result by combining these positions, but it is just as certain that there is no member in

the society who is properly qualified to assume this responsible position that would be willing to give up his practice for \$2500, and then not have any assurance of his appointment on the State Board by the Governor of Pennsylvania.

The committee wishes to comment favorably upon the original style used in presenting his plea for greater efficiency in our State Society.

GEO. S. SCHLEGEL, *Chairman*,
W. H. FUNDENBERG,
W. D. DeLONG.

Dr. SPENCER. It seems to me that action upon most of this report would be by recommendations for the Council to act upon. This report is before the members, and open to discussion.

A motion was made that the report be received and referred to the Council. (Motion carried.)

The President then resumed the chair.

REPORT OF AUDITING COMMITTEE.

Dr. SEIP, Allentown, reported that the auditors had examined the records of the treasurer, and had found them correct.

On motion, the report was accepted and the auditors discharged.

The President then introduced Dr. J. V. CONZETT, Dubuque, Iowa, who gave an illustrated lecture on "Cavity Formation for Inlays."

The PRESIDENT. Unfortunately Dr. Conzett has to leave us tonight, although we expected to have him with us for the entire meeting. Therefore I would propose that at this time we extend a rising vote of thanks to Dr. Conzett. (Motion carried.)

The meeting then adjourned until 8 P. M.

TUESDAY—Evening Session.

The meeting was called to order by the president, Dr. Van Horn, at 8.30 o'clock.

The PRESIDENT. The first paper will be read by Dr. Burton Lee Thorpe of

St. Louis, Mo. Dr. Thorpe is a dental historian of no small moment, and I believe he will give you an illustrated lecture that will live long in your memory.

It gives me great pleasure to introduce Dr. THORPE, who will give us a paper entitled "The Past Fifty Years of Dental Progress, and the Contributions of Pennsylvania Men."

Major W. A. HECKARD addressed the audience on the subject of the Preparedness League, and showed a number of lantern slides.

The President made various announcements with reference to the program, and the meeting then adjourned until 9 o'clock Wednesday morning.

WEDNESDAY—*Morning Session.*

The meeting was called to order by the vice-president, Dr. W. A. Spencer, Carbondale, at 9.45 o'clock.

Dr. PERCY R. HOWE, Boston, Mass., read a paper entitled "To What Degree are Oral Pathological Conditions Responsible for Systemic Disease?"

[This paper was published in full at page 33 of the January issue of the DENTAL COSMOS.]

DISCUSSION.

Dr. Howe. I have sometimes found that I have not made myself clearly understood. I am heartily in favor of hygienic measures in the mouth. The need for hygiene, however, indicates some bodily derangement. It is not the hygienic mouth that makes a man healthy; it may be a contributing factor. The resultant good is principally upon the teeth.

I have stated at the beginning of my paper and I state again that abnormal or pathological areas about the teeth must of course be cleared up. That is our daily work. I believe that evidence is strongly in support of the idea that the effects are in the main largely dental. To go back to purely hygienic treatment,

the interesting point from a scientific standpoint is why one needs hygiene; naturally, one should not require such an artificial procedure. In the clinic that I am connected with I constantly wonder why it is that one group of youngsters who never saw a toothbrush have no signs of decay and another who follow all the teachings of the hygienists still have progressive decay.

The reason I talk against extensive extraction is that when we resort to this we admit failure—we admit that, after all, dentistry is not the broad profession that I believe it to be. If we have infective areas around the teeth, for Heaven's sake clean them up, but I see no reason to expect a profound systemic effect to follow on the basis of infections of the streptococcus type. In rare instances I have isolated hemolytic streptococci from a pyorrhea pocket. These micro-organisms are outside the present discussion, and are never found in dental abscesses or the so-called granuloma.

If we render serviceable unserviceable teeth we may naturally expect a nutritional improvement, perhaps a nervous improvement. This is an all-important service to the general condition, but is not spectacular. If nature is not competent to care for a pulpless root it would show a serious condition. We know, however, that nature has endowed the body with very elaborate protective processes. The human organism is wonderfully constructed, and is ceaselessly engaged in processes that provide for its every need. Should they cease for a moment, then life itself would cease. Metabolism and nervous factors are fundamental among these processes; the teeth play their part here, and we should do all we can to retain them.

Dr. H. M. Beck, Wilkes-Barre. You have made the statement that you have seen a number of children with six, seven, or eight abscesses, and that the children did not have rheumatism, or arthritis, or other conditions.

Dr. Howe. Not that I could detect.

Dr. Beck. That is not a fair statement. A child will come into the free dental clinic, and I have yet to see a

single child who had two or three abscesses that was not run down and anemic. We have a free clinic in Wilkes-Barre. A little girl came in with four alveolar abscesses. She was anemic and run down. I said to her mother, "How long has this been going on?" The mother said, "Since before Christmas." "Why didn't you see a dentist?" "I could not afford it."

Any dentist in Wilkes-Barre would have been glad to treat that child. We cured the abscesses, and in two weeks, with no other treatment than the food she got at home, the child gained eight pounds. If you let that child go on, the condition would end disastrously. An abscess in a child, or in any person, is a slow, insidious poison. It is not like the poison in pneumonia. The germ of pneumonia develops in three, five, or seven days, and nature sets up a reaction—a high fever; but that does not occur in these abscesses. That same child that had the four abscesses might go along for six, eight, ten, or twenty years, but by the time she got to be forty years of age, something would break down in her alimentary tract, and she would have kidney complication, or arthritis, or something else.

There is not a man who comes up for examination whose teeth are all broken down who is free from infection, who is absolutely free from Bright's disease, arthritis, endocarditis, or one of those things. I disagree with Dr. Howe absolutely.

Dr. Howe. I know how you feel, but I think you are wrong. I do not wonder that the child lost flesh. If there is anything that will take the starch out of a youngster, it is toothache. If he can only bite upon one corner of his mouth and his teeth pain him, he is in misery. Put the child's teeth in a serviceable and hygienic condition, give good food and plenty of it, let him run and live in the open, and he will be all right.

I do not think that diabetes can be attributed to the teeth. Many men have studied diabetes, and I know of no book that considers the dental condition the

causative factor. Of course a diabetic has diabetic teeth, and you are right in cleaning up such a dental condition. The same I believe to be true in Bright's disease.

We must not run away with the idea that the teeth cause all diseases. Practice on this basis has caused much harm. I have seen young ladies with their beautiful sets of teeth badly mutilated and with many extracted, because they were erroneously supposed to be the cause of some bodily affliction. In one such case the dentist and the physician failed to detect early an ovarian tumor, which through their limited view of matters attained a large size. I think that it is very doubtful indeed if the teeth ever caused heart trouble. The proof advanced is far from conclusive. It is not yet certain that arthritis is an infectious disease. It may be, but it is a mooted question. I think that if Dr. Beck would read Dr. Nathan's article it would be profitable.

Dr. Beck. I have it.

Dr. Howe. In his curative measures he disregards the infectious idea and leans upon nutrition.

I have seen records of many cases that have responded in a very wonderful manner to this treatment.

On motion, a rising vote of thanks was tendered to Dr. Howe for his excellent paper.

Dr. SWING then addressed the meeting on the subject of the Preparedness League.

ELECTION OF OFFICERS.

The society then took up the special order of business set for 11 o'clock, the election of officers for the ensuing year. The result was as follows:

President—Dr. W. A. Spencer, Carbondale.

First Vice-president—Dr. G. S. Schlegel, Reading.

Second Vice-president—Dr. R. H. D. Swing, Philadelphia.

Recording Secretary—Dr. J. F. Biddle, Pittsburgh.

Corresponding Secretary—Dr. O. J. Specker, Reading.

Treasurer—Dr. A. B. Miller, Kingston.

Executive Council—Drs. G. H. Smock, W. H. Lowell, and W. L. Fickes.

Board of Censors—Drs. E. W. Bohn, F. D. Miller, R. R. Hutchison, D. T. Davies, and John Evans.

Board of Examiners—Drs. A. P. Lee, A. H. Reynolds, E. J. Donnegan, and W. H. Fundenberg.

The meeting then adjourned to 8 o'clock P. M.

WEDNESDAY—*Evening Session.*

The President called the meeting to order at 8.15.

The Secretary read the report of the Council, and a motion was made to adopt the same. (Motion carried.)

The PRESIDENT. It gives me much pleasure to call your attention to the next feature on the program, a lecture by Dr. W. A. PRICE of Cleveland, Ohio, who is well known to you, the subject of his address being "Some Shortcomings of Our Current Methods for the Management of Infected Pulpless Teeth."

The PRESIDENT. We have listened to a very excellent lecture. It was a little longer than Dr. Price originally intended, owing to the fact that this morning we received a letter from the secretary of Dr. Daland—who was to give us a paper this evening—virtually to the effect that he would not be here. That is very short notice, of course, to do any filling-in, so Dr. Price very kindly extended his lecture a little longer, and we are all very grateful to him.

The meeting then adjourned to Friday morning at 9 o'clock, the third day (Thursday) being devoted to clinics and demonstrations in the morning and afternoon, and an informal banquet for the members in the evening.

FRIDAY—*Morning Session.*

The President called the meeting to order at 9.30 o'clock.

The Secretary read the report of the Council, and stated that the Council also

discussed the advisability of changing the by-laws to conform with the changes made in the constitution.

A motion was made to adopt the same. (Motion carried.)

The PRESIDENT. The next item on the program is a paper entitled "Partial Dentures," by Dr. W. E. CUMMER, Toronto, Canada.

The PRESIDENT. We have listened to a wonderful talk and demonstration. I read only a short time ago a little article regarding the Canadians who went "over there." They called them "fighting sons of guns," and I wondered why. Now we know. It is that spirit of assurance and conscientiousness that has been exhibited by the essayist at this meeting—a thorough worker, a real worker. Dr. Cummer has been not a wheel horse but a wheel team, and we thank him very kindly.

Dr. H. E. FRIESELL. It is customary on occasions of this kind to give a vote of thanks to essayists who have given something special to the association; but this time I think we owe Dr. Cummer a special vote of appreciation. We have had many men who gave us excellent papers and excellent demonstrations, but I know of no one who has given so much as the essayist, Dr. Cummer. I would therefore move that this society extend to Dr. Cummer a rising vote of appreciation for the splendid work he has done for us. (Motion carried.)

Dr. FRED. D. MILLER, Altoona, Pa., then read a paper entitled "The Dental Hygienist." The paper was illustrated by lantern slides.

Dr. FRIESELL. The Legislative Committee has had a communication from Dr. L. Ashley Faught of Philadelphia, in which he states that the Academy of Stomatology, in 1914, passed a resolution recommending that the State Society take some legislative action or prepare for some legislative action which would exempt dentists from jury duty. That was referred to the State Society.

What final action that was taken is rather indefinite, and the question has been presented again at this meeting—that some bill or amendment be recommended which would exempt dentists from jury duty, should that action be considered desirable by the members of the society.

Dr. SEIP. Is it Dr. Friesell's idea that the work be carried out along that line? If it be adopted, will that lead to measures being taken to exempt dentists?

Dr. FRIESELL. That was not the intention of the chairman of the Legislative Committee. It was merely to present the matter to the society. If this report is received, it would mean that the society had simply heard the report, but had not approved or disapproved of it.

Dr. SPENCER. I move that the report be received. It is my opinion that any citizen of the United States should serve on the jury unless he has sufficient reason to show why he should not. I have never served on the jury, although I have been in practice thirty years. I was called at one time, but was unable to go on account of sickness; but I certainly would have taken the trouble to go. I believe any man in the community who is worth more for something else than for the jury will be excused; but so many people ask to be excused, and in that way we get a lot of men not fit to be on a jury. I do not believe dentists ought to be excused from jury duty. I think it would be a good idea for dentists to serve on juries once in a while. If a man has a good reason to be excused, the judge will excuse him. We should do our duty in these times. (Motion carried.)

The PRESIDENT. It becomes my very great pleasure to appoint Drs. Williams

and Friesell to escort Dr. Spencer to the chair for installation.

Dr. SPENCER, it gives me great pleasure to turn over to you the gavel of the Pennsylvania State Dental Society, for I feel sure you have not only the ambition but the ability to carry forward work of intense interest to the dentistry of Pennsylvania. I could not conceive of a man who is safer to start the second half-century of the Pennsylvania State Dental Society.

I want to extend to you my sincere good wishes, and my most hearty congratulations.

Dr. SPENCER. I have not prepared any speech to deliver at this time. I took the opportunity last night to express my appreciation and to tell you I thought it an honor to be made president of the Pennsylvania State Dental Society. In almost any assemblage, I consider it a success when you wind up with the climax that everybody is interested. I also appreciate the fact that the president who just left the chair must have felt gratified to be able to turn over the gavel at that time, after the long discussion we had here. I believe these discussions are all right, and that that is the way to go at the meat of the matter. I am glad you have not taken hasty action at this time. I did not say anything about this matter, and I will just state my position now—which is, I do not know enough about either side to express an opinion. I assure you I will have a better idea as to the right or wrong of the thing by next year. I hope you will all be present, and that we will have as successful and as harmonious a meeting as we have had at this fiftieth anniversary meeting.

The society then adjourned.

Eastern Association of Graduates of the Angle School of Orthodontia.

Ninth Annual Meeting, held in New York City, May 6 and 7, 1918.

(Continued from vol. lx, page 934.)

TUESDAY—Morning Session.

The meeting was called to order by the president, Dr. Murlless, at 10 o'clock, Tuesday, May 7, 1918.

Dr. A. W. CROSBY of New Haven read the report of the Committee on the President's Address, as follows:

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

Relative to the four recommendations, we would suggest the following:

First. The committee recommends that the dues be raised to \$10 per annum, believing that it would work no real hardship to the members, and that it would greatly facilitate the scientific scope of the society.

Second. That the plan to appoint a committee to "inquire into and recommend a plan for establishing a scholarship of such a character as to attract and develop men qualified to become leaders in our specialty" be referred to a carefully selected committee.

Third. Recognizing the need of a better X-ray technique, the committee respectfully suggests that steps be taken to get in touch with members of a society of radiographers, with a view to improving, and as far as possible standardizing, the technique for orthodontic procedure.

Fourth. That the incoming president appoint a committee on "The Sequence of Orthodontic Procedure," as suggested in the President's Address.

A. W. CROSBY,
H. E. KELSEY,
J. V. MERSHON,
Committee.

A motion was made to accept the report. (Carried.)

ELECTION OF OFFICERS.

The election of officers for the ensuing year resulted as follows:

President—Dr. H. K. Hatfield, Boston.

Vice-president—Dr. A. L. Johnson, Springfield.

Secretary—Dr. E. Santley Butler, New York.

Treasurer—Dr. W. S. Watson, Brooklyn.

The following applications for membership were received and referred to the Executive Committee:

Dr. Wm. G. Law, New York City.

Dr. C. C. Howard, Atlanta, Ga.

Dr. J. A. Gorman, New Orleans, La.

Dr. H. A. Pullen, Buffalo, N. Y.

Dr. MILO HELLMAN of New York City then read a paper, entitled "Artificial Feeding and Its Bearing on General Disturbances and Malocclusion of the Teeth."

[This paper is printed in full at page 97 of the present issue of the DENTAL COSMOS.]

DISCUSSION.

Dr. J. V. Mershon, Philadelphia, Pa. It is not my intention to discuss Dr. Hellman's paper from the standpoint of criticism or addition. One is always very favorably impressed with a paper in which the ideas seem to coincide with his own. That is the case with Dr. Hellman's paper. It has been my custom recently to place more importance on the case history than upon the actual presentation of malocclusion of the teeth.

One point which impressed me very strongly in the paper was that relative to the length of time it takes to treat cases. One of our most eminent surgeons of international reputation several years ago was supposedly curing epilepsy by performing operations. A paper was being read by him before one of the national medical societies, and he was presenting cases that he had cured, his assistant having charge of the different patients in the anteroom. During the reading of the paper, the anticipated appearance of one of the patients before the audience caused the patient to throw a fit. The assistant wrote a little note and sent it in to the essayist. He read the note and went on with the paper. In a few minutes he folded the paper, and said: "Gentlemen, I will give you a synopsis of the rest of this paper." Then he said: "I believe the only sure cure for epilepsy is death." And so I believe the only sure cure for some of our cases of malocclusion is death.

Dr. B. W. Weinberger, New York City. I cannot permit this opportunity to pass without expressing my appreciation of Dr. Hellman's paper. It is one that will require reading and re-reading before we can appreciate and realize its importance. There is one fact, however, that Dr. Hellman brought out which I think the sooner we comprehend, the nearer we will be to our goal, and the sooner we will be able to finish our cases. That is what Dr. Merston tried to emphasize—that we must go deeper into the etiology of our cases than the mouth. We must secure good case histories in order to do this.

Again, we will have to eventually have physicians co-operate with us, to interpret these cases from their standpoint in order that we might know along what line to work; and the earlier we reach that point—knowing the foundation of the child before we begin—just that much sooner will we understand our work, and know when to undertake, to continue, and when to stop a case. There are many pitfalls in the treatment of cases.

Why many of our cases are tonsillar

with prenatal origin I have already endeavored to explain. Nearly all conditions are found to be closely related, and we must take all this into consideration, otherwise we will be lost in treating our patients.

When we each report to Mr. Spier ten cases, as Dr. Ferris suggested this morning, I believe if we use these records properly they will enable us to come to some conclusion; until then we will have a lot of cases that we cannot continue and cannot handle properly. If all the men will get together and take the time to work out a uniform record we shall soon realize that we must leave certain cases alone, and not try to treat all of them.

Dr. R. H. W. Strang, Bridgeport, Conn. I admire Dr. Hellman's courage in attacking the etiological side of our problem. This task is a difficult one, for we are dealing with the human body in our study of cause and effect, and are confronted with all the intricacies of metabolism, presenting unsolved chemical problems that baffle the most learned. We can classify malocclusion, but we cannot classify the patient, and therein lies the first stumblingblock to a successful termination in the treatment of these oral deformities.

The causes of malocclusion may be divided into two classes, mechanical and physiological or metabolic. The mechanical have been discussed for years and are quite clearly understood by the profession. The metabolic, because they are intricate and subtle, have been overlooked, and while it will require the most careful and painstaking study to unravel the problems therein presented, yet eventually they will be unraveled, and when this has been done I believe we will find more solutions as to the cause of failures in this hidden side of the etiological problem than in the one that we now know so much about, namely, the mechanical side.

Dr. Hellman's first remarks were based on the effect of diet on development, discussing modified milk and artificial foods. Along this line a question might be presented, *i.e.* Is it the difference in

the percentage or kind of protein, carbohydrate, or fat that is responsible for the defects that appear later, or is it not due to the fact that there is unsupplied in this artificial mixture certain hormones which that individual child requires, and which can only be furnished by the mother herself? I believe the latter to be true in many cases, so that no matter what food is used as a substitute, it is impossible to put into that food the complex chemical substances that the mother alone can produce. It may be that eventually these substances will be isolated so that their chemical composition may be determined, thus making it possible for them to be produced synthetically; or, on the other hand, solutions may be prepared from glandular secretions containing these hormones. If this can be done, artificial feeding will be made more scientific and effectual, and errors of development will be less prevalent in this class of patients.

In studying these errors of development, were you ever puzzled by the fact that nature draws such sharp lines in certain cases? To illustrate: Models of infra-occlusion in the molar region or supra-occlusion in the incisor region will often show normal lateral and forward growth. Again we may find perfect forward and vertical development but a failure in the lateral growth. In many of these cases mechanical etiological factors can be completely ruled out. The problem is a metabolic one, and therefore is extremely intricate.

Several years ago I was discussing cases and showing models to a physician, when he rather startled me by asking, "What percentage of successful results do you have?" I was only a beginner then, and looked on normal occlusion as a staple end-product, believing that if I obtained normal occlusion in all cases my troubles would be over, and my successes proportionately of high percentage. I have since pondered much on that question, for I have found, as all of you have, that obtaining normal occlusion does not mean that all causative factors have been overcome or removed, and therefore, it is not a staple end-product spelling success in every case.

It is indeed discouraging not to obtain perfect results in all cases after years of conscientious work. While there is no doubt that our proportion of failures is greater than it should be, and therefore should inspire us to ever be studiously seeking a solution of this equation of cause and effect, yet we must not be led to believe that our specialty is a failure, and lose faith in our calling. Does every surgeon produce a perfect result? does the medical man cure every disease? or does the specialist in orthopedics perfectly overcome maldevelopment? No! each has his failures, his partial successes, and his perfect results. So is it with us; we are bound to have disappointments, treating as we do a mechanism that depends for its development on certain forces that are at the present time out of our control completely. But there are many of these forces that research will eventually place within our control, and it should be our aim to discover these important means of control at the earliest possible moment, as suggested and exemplified by the essayist in the paper presented.

Dr. Hellman (closing the discussion). I have nothing to offer in conclusion. There have been no issues raised, and there is nothing further to say. I thank you for your kind attention.

Dr. J. V. Mershon, Philadelphia, Pa. I think it is a mark of great appreciation of the paper that there is no discussion. It is something every man in this room has been hungering for, and I think it is a silent expression of appreciation. I want to move that a vote of thanks be extended to Dr. Hellman. While that may be out of our ordinary custom for one of our own members, I think that paper is worth it.

The motion was carried unanimously.

Dr. J. LOWE YOUNG read the report of the Committee on Metals for Orthodontic Purposes.

Dr. ARTHUR ZENTLER of New York City then gave a lantern demonstration and lecture on "The Use of Orthodontic Appliances in the Treatment of Frac-

tures of the Mandible and Maxilla from War Casualties."

[This lecture with illustrations is printed at page 128 of the present issue of the DENTAL COSMOS.]

DISCUSSION.

Dr. H. C. Ferris, New York City. As chairman of the committee under which this subject comes, I wish to express my appreciation to Dr. Zentler for his interesting paper. He has shown me probably 150 slides, and has here displayed the most important ones, and I think the demonstration most beautifully illustrates the form of the appliances used by the Germans in the first year of the war, this material having been sent to Dr. Zentler by a friend from a German hospital. We can profit by their practical methods, upon which we may hope to improve in our study of the subject.

The hygiene of the mouth in these cases has not been considered, but having had some experience in handling fracture cases, I know that wherever there is an accumulative surface in contact with the tissues, the apparatus becomes a great source of annoyance to the patients, which sometimes approximates that of the wound unless they are continually attended by the nurses. A great many of these appliances could be reduced in size greatly to the advantage of the patient.

I hope a committee will be continued to pursue this study, that we may be stimulated to handle these patients by American methods.

Dr. C. C. Howard, Atlanta, Ga. I would like to ask the essayist at what stage of the healing process do they apply orthodontic appliances for the correction, and do they always wait for the elimination of all infection before the application of orthodontic appliances?

The President. I can see there will be a responsibility develop upon us in the near future to be actively engaged in work of this sort, and I hope you will all ask questions about it.

Dr. J. Lowe Young. I understand

there were no bands attached in these cases.

Dr. Zentler. Yes, there were.

Dr. Young. The teeth are wired with ligatures?

Dr. Zentler. Yes, at times.

Dr. Young. I wondered what particular advantage this style of appliance would have over our old extension arch E—the nickel-silver arch—which was slipped into tubes on molar bands. I think it was a year ago last November that I saw the set of appliances that Dr. Harold Vaughan had in the city, which he was showing at a medical society meeting and with which he was treating some fractures. He simply adjusted the clamp bands on the molars. Although I did not ask him, I presume he used nickel-silver bands, and fitted them as well as he could, putting them on without cement, and then putting the E arch in, upper and lower, and wiring the broken parts to that. Where he had a fracture of both upper and lower jaw he also wired the two jaws together, and fed the patient with liquid food passing back of the molar teeth. It seemed to me there were great possibilities in that use of the expansion arch.

Dr. Wm. G. Law, New York City. This subject is today the most important one that this society can take up. Having lived for some time in the enemy's country, and having just returned from there, I am familiar with what is being done in the German hospitals. We are all able to get much valuable information from Dr. George Hayes of Paris and from our colleagues in England and Italy. The experience of all men should be combined into a system and used for our boys who will have injuries of the jaws—and the chances are that we will have a great deal of this work to do! I think it was Job of the Scriptures who said, "Oh that mine enemy would write a book!" Several books have been written by men in Germany and Austria, and some of these are probably in America. They may be obtained in Holland or Denmark, or probably in England, where much information on this subject has been gathered. I think a most won-

derful work, for present as well as for future benefits, would be for a society of orthodontists to appoint a committee whose members would become soldiers, a part of the national army, and would devote much of their time to working out and perfecting a system for caring for injuries to the jaws which would be practical from the standpoint of ease and comfort to the patient and making restoration as perfect as possible, studying out the best materials to use, etc.

For certain types of cases the system used by Solbrig and Warnekros of Berlin is most excellent. This system employs no bands or arches and the appliances are attached to the teeth by means of soft gutta-percha. This method and many cases are reported by Professor Warnekros. Professor Williger uses a system similar to that advocated by Dr. Angle. Many of the German hospitals use this method. I believe Professor Chiavaro of Rome uses a system employing bands and arches in his work in the Red Cross of Italy, of which he is the chief surgeon. Dr. Hayes of Paris also uses a system employing bands and arches in the hospital at Neuilly.

Having seen much of this work and knowing its value to the men, I believe the most important work we can do today is to appoint a committee of men who will organize this great work—who will investigate all the writings of all men of all countries, and experiment in our schools and hospitals and work out a perfect system for us—so that we will not have to work out a system later on when we are called upon to do our part toward helping to heal the injuries our men may receive. We must have something worked out and ready when the call comes to put our boys in the greatest comfort and to make them fit again!

The President. I think Dr. Law is elucidating Dr. Ferris' original idea—the feeling that brought this paper before us today. One thing I wanted to ask the essayist: Did I understand him to say that these arches which he showed were one-half a millimeter in diameter?

Dr. Zentler. Two to two and a half millimeters.

The President. That would be about one-tenth of an inch. Will Dr. Weinstein tell us how many thousandths of an inch the 16-gage arches are?

Dr. Weinstein. About 45.

Dr. L. M. Waugh, New York City. As the president has repeatedly said that guests might say a word or two, I take this opportunity to do so. The first thing I wish to say is to thank you for your hospitality. The second is that the Preparedness League has been busy organizing a course—we have 14,700 members in the League—for the purpose of educating the dentists here, not only in hospital centers, but in each one's office. The Government has recognized the use for orthodontic appliances in this work, and I believe the S. S. White Company and others have already received large orders for these parts; so steps are in progress for preparing the orthodontists for this work.

In analyzing these appliances I think we must bear in mind that this was in the early days of the war, and perhaps were given to men very soon after they were wounded. In thinking this over, as I have from time to time—in Buffalo I had quite some experience in fracture work in hospitals—I believe the gradual growing together of the fractured parts of the maxilla and mandible is very much preferable to an effort to immediately reduce the fracture. The surgeon works with the idea of immediately reducing it, but that is not so helpful as the gradual drawing together of the parts with appliances such as the orthodontist is capable of standardizing.

These cases were done very near the front, and hurriedly. We must devise a system of appliances that will be used in your office and in mine, to be employed when our men come back from France and after there has been considerable healing of the parts and there will be malocclusion on account of the position of the parts. These appliances were made in the first year of the war. They are not appliances that Dr. Zentler would ask us to use today. They are not hygienic at all, and undoubtedly we will devise something that will be much

more beneficial. These are large and cumbersome, and filth-accumulating.

I think the orthodontists should recognize the help they can give the Preparedness League, and I believe Dr. Beach of Buffalo, who is in charge of the work, would be glad to have your committee confer with him.

Dr. H. E. Kelsey, Baltimore, Md. There are two classes of cases, as Dr. Waugh said. I believe, from the little observation I have been able to give to the class of cases that have gone perhaps a few weeks or months without treatment, that they would require not more delicate appliances but more powerful ones. If a section of the jaw has been lost at the symphysis, you know how the two sides of the jaw are drawn in by the muscles, and it requires a strong appliance adapted to the needs of the case to regain the proper separation, and I have no doubt the Preparedness League has recognized this need.

I have had a case very recently which was so similar to a trench wound that it would easily be mistaken for one—in which a piece at the symphysis of the mandible was shot out by a pistol-ball, and in which we fixed the two lateral halves of the jaw by a splint. We did not use screw bands, but I made the usual heavy orthodontic cemented bands and had an external and internal heavy arch wire with jacks across the front lingually and labially to restore the occlusion, and this readily brought the lateral halves of the jaw into proper relation with the upper. Suitable appliances could be adapted for all cases if the results of the experience of all the men who have been working along these lines up to the present time, especially those in the field and base hospitals on the other side, were added to the skilful technique of the orthodontist.

Dr. R. H. W. Strang, Bridgeport, Conn. In the treatment of fractures I have obtained the best results in those cases where the fracture has been reduced and fixed immediately after the primary traumatic swelling has disappeared. Any fractures that have gone for six or eight weeks without treatment

are almost invariably infected, and therefore do not respond as readily when treated.

Dr. G. W. Grieve, Toronto, Canada. Before Dr. Waugh spoke I was inclined to get on my feet, because it seemed to me the major portion of this work would have to be done not in America but overseas. While a great deal can be accomplished in this country after the patients are brought home, the larger portion will have to be done before they leave Europe. That seems to be the problem. So far as I know, the majority of the men who have gone overseas in dental service are men without any special knowledge in orthodontia; consequently those men are not looking to the orthodontist for the assistance he can give—they are going on with their own methods. Some have developed decidedly good ones, I presume, while others are quite crude. It would seem that the greatest service we could render in this country would be to develop appliances, as suggested by some of the members, and, in addition, have the "powers that be" overseas recognize the service orthodontists can render, and then they will invite us to go over and assist them.

In Toronto we have a great many returned men. We have a large dental corps, yet, so far as I know, not a man in orthodontia has been invited to assist in a fracture case. Possibly some of us could be of great service. I never made any effort to force myself in, and have never been invited.

If this association, through its committee, could devise a technique, and if the officers in command of the dental corps could be shown that we can be of service, and have them invite us overseas, I think we could be of great service. The cases must be attended to over there, and there are some of the younger men at least who would make it a point to go overseas. I have associated with me a young man who has had just a year's experience in orthodontia, but still he has greater knowledge than a man in general practice would have, and is ready and willing to go. He may probably be

called upon later to shoulder a rifle, but I feel that a man like that should not serve in the ranks when he could be of such great service in this way.

Dr. Zentler (closing the discussion). Supplementing what Dr. Ferris said, I shall add that a footnote in my paper gives the names of the men under whose direction the work illustrated in these slides was done.

Replying to Dr. Young's question, I have to call attention to that part of the paper where I spoke of the importance of having the bands especially well fitted and tightly cemented. It is not very easy to show the bands in illustrations of fracture cases, and I doubt whether they can easily be shown on molars, even in mouth photographs of orthodontic cases.

I have not gone into the technique, because I know that every man here will be capable of adopting the technique most suited for the case under consideration.

Dr. Waugh's remarks I wish to answer by saying that it was my intention to show that orthodontic appliances, regardless of type and style, ought to be used, and not the older methods of bandaging, etc., which have proved not only less successful but in many instances harmful. As to the fear that such appliances may be unhygienic, I do not believe any orthodontic arch and band appliance, properly placed and kept as it should be, and as shown in the slides, would be unhygienic.

Regarding the diameter of arch, none but heavy appliances can be used for this work. Whether the arch mentioned by Dr. Young is heavy enough, I am not sure; I rather think it should be heavier. There is this great difference: The ratio is as 1 to 100 comparing what we wish to achieve in orthodontic treatment and what we must accomplish in fracture treatment. It should not be the aim of anyone treating fracture cases to bring about normal or correct occlusion, but only "original occlusion," as I have especially indicated in my paper by specifically using this term. To do this we must move parts which have been dis-

lodged and which tenaciously hold to their new position, and we must use considerable force, whereas in orthodontic treatment we use only gentle pressure.

Dr. Young asked whether there is any advantage in using one or another type of appliance. None at all, provided the correct technique is applied to the case. The only thing I have shown which differs from the style of the Angle appliance is the Schroeder sliding joint. When there is a tendency to continuous relapse of the fractured part of a mandible, no matter what you have done to bring the parts into proper relation, you will have to use this sliding joint for a long time in order to be sure to obtain consolidation.

For simple cases—of which there probably will be very many—the wiring of the lower teeth to the upper, around their cervices, uniting them as you undoubtedly all know how, will answer the purpose very well. There is, however, the disadvantage that the jaws are kept together, and we cannot feed the patient anything but liquid food, while with the intermaxillary elastics the patient can open the jaws.

It was suggested, speaking of different sorts of appliances and methods, that a committee be appointed to study the various appliances, etc. Of course there is nothing more advantageous than investigating all methods before deciding on the best one to be adopted. This morning, just before I came here, I received a French surgical volume in which there is a section on the treatment of fractures of the jaws at La Panne, a military hospital in Belgium. A method formerly entirely unknown to me is therein described. In order to avoid taking impressions, orthodontic appliances for the individual fractured parts are made in sections. Supposing there is a multiple fracture of the mandible, one line being distal to the right bicuspid, and the other to the left bicuspid, bands are applied to one of the molars on the right side and one on the left side. To these bands are previously soldered sections of arch wire long enough to overlap at a point in the

anterior region. After cementing the different sections into place, the fracture is reduced and while held in proper relation the ends of the arch wires are soldered together with the soldering iron. I have some doubt as to this union by soft soldering being sufficiently strong, but good results are reported. Of course there are many methods, and every one will evolve a little different technique for the case in hand.

A question was asked as to the proper time to place the orthodontic appliances in fracture cases. It is always well to have all the foreign parts removed first. There is no reason why this cannot be done the first day the patient is brought into the emergency or base hospital.

Often these cases are placed under anesthesia to reduce the fractures. In conjunction with this, I will reply to the question as to whether it is beneficial to treat these cases early. Certainly; as Dr. Strang said, it is very beneficial to treat them as early as possible. None of the cases I have shown in these slides, and in other slides which I have among my collection, have reached the surgeon in the hospital later than ten or twelve days after the wound was received. If the cases of wounded jaws can be gotten back here within two weeks, we shall be able to do more efficient work than if we have to work on them later when adhesions which have to be broken up before attempting treatment have been formed. I am sure that if the fracture can be reduced and held in position early, it is of the greatest benefit to the patient, and that the orthodontic appliance can be used to the best advantage.

Someone said—and this seems to be the general opinion—that the orthodontists experience difficulties in getting into hospitals and doing what they feel they can for the cases that need their assistance. While at any other time modesty is very proper, and one should wait to be invited, I believe today the time is ripe, and the occasion demands that we must not wait to be asked to do things; but if any one of us knows that he has something with which he can help the wounded men returning from the

front, it is the proper thing for him to be a little forward, and go ahead and do what he can without waiting to be asked. (Applause.)

On motion a vote of thanks was tendered to the essayist.

Dr. Weinberger. A great many of you are acquainted with the index that Dr. Black brought out some time ago, similar to the Index Medicus. It has been suggested that the Educational Committee bring the matter of indexing this literature before the Rockefeller Foundation. Dr. Zentler only had records of what the Germans had done in this line. We need all that literature, and we need it indexed.

I move that this society support the committee that has charge of the matter, and bring it before the Rockefeller Foundation and have it indexed, so that every dentist in the country can make use of it.

Dr. Kelsey. I was just talking with Dr. Rogers about the literature on this subject. From several different countries and different sources there are some excellent accounts of what is being done, but there seems to have been no collaboration in indexing it. I second Dr. Weinberger's motion.

The motion was carried.

The meeting then adjourned to 2.30 P. M.

SECOND DAY—*Afternoon Session.*

The afternoon session was devoted to clinics and reports of cases.

Dr. ALFRED P. ROGERS, Boston, Mass., showed Improved Methods of Constructing Bands for Any Tooth.

Dr. J. A. CAMERON HOGGAN, Richmond, Va., gave a clinic on determining the Most Desirable Form of Occlusion in Mature Cases, where there has been mutilation.

Dr. J. V. MERSHON, Philadelphia, Pa., demonstrated the use of the Removable Lingual Arch, with its various attachments for the Treatment of Malocclu-

sion, Tooth Rotation without bands, Mesial and Distal Movement of Individual Teeth, etc., also the Labial Arch in conjunction with the Lingual Arch for Root Control.

Dr. L. G. SINGLETON, Pittsburgh, Pa., gave an exhibition of Feature Modeling in Clay.

Dr. H. E. KELSEY, Baltimore, Md., gave a further presentation of methods and appliances for Bodily Mesial and Distal Movement of the Teeth.

Dr. F. L. STANTON, New York, showed a Device for Correcting Supra-occlusion.

Dr. H. C. FERRIS, New York City, showed instruments for Bending Any Part of the Ribbon Arch without disturbing the balance.

Dr. A. L. JOHNSON, Springfield, Mass., showed a method he had devised for Determining the Movements of the Tongue.

The Secretary moved a vote of thanks to Dr. Desnoes for his splendid work in arranging for the meeting.

The motion was carried unanimously.

The President appointed Dr. Kelsey to conduct the president-elect, Dr. Hatfield, to the chair.

Dr. MURLLESS. Dr. Hatfield, I take pleasure in turning over to you the emoluments, honors, and responsibilities of the office of president of this association.

Dr. HATFIELD. I hope I am not too much overcome to accept the responsibilities thrust upon me this afternoon to congratulate Dr. Murlless upon the very successful year's meeting. We all realize that this has come about largely through the very active interest the members have taken. I shall hope for that co-operation next year. I hope to see you all in Boston for our next meeting in November.

The meeting then adjourned.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDWARD C. KIRK, D.D.S., Sc.D., LL.D., *Editor.*

L. PIERCE ANTHONY, D.D.S., *Associate Editor.*

PUBLISHED BY THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Virgin Islands, Cuba, and Mexico. Canada, \$1.40. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the EDITOR, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, FEBRUARY 1919.

EDITORIAL DEPARTMENT

The Re-revival of Dental Prosthesis.

DENTAL prosthesis, or, more specifically, denture-making, ever since the era inaugurating the practice of modern dentistry, has had a checkered career in its attempt to keep pace with the other specialties of dentistry.

Some twenty-five years ago Dr. B. J. Cigrand published a book entitled "The Rise, Fall, and Revival of Dental Prosthesis," in which he recorded the vicissitudes of dental prosthesis up to the year 1892. From that time until the present it has occupied a more or less precarious position in the art and science of dentistry, and strenuous efforts have been called for on the part of some true geniuses to prevent its entering a second stage of atrophic decadence in the cycle indicated by Dr. Cigrand.

With the death of Dr. W. G. A. Bonwill, that able and en-

thusiastic exponent of the science and art of denture-making, that branch of the practice of dentistry experienced a period of more or less decline. Within the last decade, however, there have been seen on the dental horizon signs that would lead us hopefully to believe that dental prosthesis is about to come into its own.

Dr. Bonwill's work doubtless furnished the inspiration to a group of investigators and workers to renewed efforts to establish this branch of dentistry on its proper plane in relation to the other dental specialties. Thus we are beginning to see the beneficent results of the labors of such men as Wilson, Snow, Essig—father and son, Haskell, Gysi, Williams, Walker, Christensen, Gritman, the Greene brothers, and most recently Hall, as well as numerous others, but it was not until the profession received the rude awakening by Hunter to the fact that crown and bridge work, primarily intended to delay the day when patients would be compelled to wear artificial dentures, had not only failed in its mission, except to a measurable degree, but had brought with it increased difficulties for the profession and the public, that this specialty began to receive in some measure the attention it deserved from the profession generally.

The truth of the aphorism that "It is an ill wind that blows nobody good" has once more been exemplified in the revival of interest in dental prosthesis as practically the only alternative left to the dental profession as a means of supplying artificial substitutes for the myriads of teeth condemned by the medical profession as foci of infection which may, and no doubt do, cause irreparable injury to the health of those who have been the victims of the poor bridge work so justly condemned by Hunter. We believe, however, that the medical profession has gone to an absurdly radical extreme in the wholesale condemnation of teeth as the possible cause of systemic conditions which they were unable to account for otherwise, and we are only just now beginning to see the pendulum of rationalism swinging back to its normal position. It is not the intention of the present writing to discuss the evils which have resulted from this irrationalism on the part of some members of both the medical and dental professions, but rather to cite this as the impelling force which has compelled dentistry to turn toward prosthesis for the relief of these prospective edentulous patients.

That the development of modern prosthesis has not been revolutionary but rather evolutionary is seen when we review its development in the past few years. Bonwill, in commenting on denture-making as practiced in his day, established an ideal toward which prosthesis has ever since striven:

It is not enough that we accurately adapt the plate to the gums; that we so grind the teeth to the plate as to be water-tight; that we so make every joint that it cannot be distinguished; that we so polish the plate over symmetrical curves that the tongue cannot find the least fault. We must do something besides this; we must impart action to these otherwise whited sepulchers—we must instil life therein, or our labor will be in vain.

And here Dr. Bonwill unwittingly but with prophetic vision foretold the cause of the failure of denture-making as it was generally practiced until recent years. As an illustration of how nearly the prosthetist lived up to the ideal expressed by Bonwill the writer recently heard a dentist prominent in this field of endeavor remark that, at the time he began to practice dentistry, which could not have been more than twenty-five years ago, dentists “fitted edentulous patients to dentures,” rather than *vice versa*.

Following the lead of Dr. Bonwill, the efforts of those who came later were devoted more particularly to the development of the articulator, and some conspicuous advances were made from this standpoint, but the outstanding incident which re-focused the attention of prosthetists on denture-making was when the Greene brothers promulgated a system of impression taking radically different from any that had previously been practiced, and the success which followed their practice led others to study the method, with the result that there has been developed a definite system of technique for impression taking that is precise in every step, and leads to a result which has long been sought by the profession generally, but has only been attained by a few who were looked upon as geniuses.

The writer only recently had the privilege of attending a post-graduate course given by Dr. Rupert E. Hall of Chicago, in which was delineated a system of technique for denture making which

was marvelous for accuracy of detail, and which when compared with the slipshod manner in which denture-making was taught in our schools a few years ago and in which it is still being taught in some schools, enables us to readily understand why the results of previous years have been so generally unsatisfactory, and justify the statement made recently by one of our most prominent prosthetists that "No dentist will deny the fact that the most successful dentures constructed at present fall far short of the natural in masticating efficiency, which, in the last analysis, is the most necessary function of teeth whether they be natural or artificial."

The system of technique as shown by Dr. Hall constitutes what to our mind is the most attractive and interesting exhibition of denture-making that has ever been taught to dental students, and the results of such teaching cannot but tend to place prosthesis on an equal footing with every other specialty of dentistry.

Reference has been made to the important part which the Greene brothers have played in the evolution of prosthesis. The writer vividly recalls attending a convention of the National Dental Association in Denver and witnessing a clinic on an extremely hot day given by Dr. J. W. Greene. The degree of enthusiasm exhibited on that occasion and under such unfavorable conditions easily foretold the far-reaching influence which Dr. Greene's work would inevitably exert in his field of endeavor, and to his activities probably more than to any other may we attribute the universal interest that is manifest on every hand in what we have designated as the re-revival of dental prosthesis.

The need and demand for workers in this field was strikingly shown when the Dental Corps of the army was making every endeavor to mobilize prosthetic dentists for army work, and the failure to secure a sufficient number of prosthetic specialists to care for the needs of those wounded in battle has tended to emphasize the necessity for more interest in this line of work, and will no doubt be an impelling force in focusing attention more particularly on this important specialty of the dental profession. Let us hope that the impetus given to this phase of dentistry within recent years will eventuate in the ultimate development of

sufficient prosthetists to make dentistry as thoroughly prepared in the future to meet any emergency that may arise in this branch as was so happily exemplified in other branches of the profession during the recent world war.

The Passing of the "Dental Review."

WE note with much regret the announcement in the December issue of the *Dental Review* that it ceases publication with that issue—for the reason, as frankly stated by the editor, that the publishers do not care to longer assume the expense of publication.

Established by Dr. A. W. Harlan, in 1886, and published for two years as an independent journal, the responsibilities of publication were assumed in 1889 by H. D. Justi and continued for some thirty years. In 1902, Dr. C. N. Johnson succeeded Dr. Harlan as editor. The *Review* has made an enviable record in the dental literary field, publishing during its career many of the foremost contributions to the science and art of dentistry. On its very first cover-page the editor announced as the guiding *motif* of the *Dental Review* that it would be "devoted to the advancement of dental science," and it has unfalteringly adhered to this purpose with a result highly creditable to its editors and publishers. It could not have been otherwise under the editorial guidance of two such able men as A. W. Harlan and C. N. Johnson.

The *Review* is dead, but its impress and influence will long be felt by the dental profession, and the thirty-two volumes issued during its existence will in the years to come stand as a lasting literary monument to the two men who made it such a conspicuous success in the dental journalistic field.

Death of Dr. S. H. Guilford.

WE regret to announce the death of Dr. S. H. Guilford of Philadelphia, on January 18, 1919. A full obituary notice will appear in the March issue of the DENTAL COSMOS.

PRACTICAL HINTS

This Department specially welcomes the brief presentation by our readers of any novel suggestions or methods which in their own practice have proved to be time-saving or to possess other features of advantage.

Economy in the Use of Fissure Burs.

By BENJAMIN F. GIBBS, Des Moines, Ia.,

FIRST LIEUT. D.C., U. S. ARMY.

AN effective and simple means is hereby suggested for economizing in the use of fissure and cross-cut fissure burs—for example, No. 558.

It is a fact that the upper half, or the half of the cutting portion adjacent to the shank, of this type of bur, which is comparatively expensive and scarce, especially at this time, is seldom utilized, the bur being usually discarded after the distal half, or end, has become useless.

The means by which the life of these instruments may be doubled is effected

by grasping the distal half of the blade with a pair of ordinary office pliers at right angles, at the same time exerting lateral pressure. The steel of which these instruments are constructed, being of a brittle nature, easily breaks at the point of contact with the edge of the pliers.

After these instruments have been treated in this manner, they are as effective as a new bur for the purpose of opening and extending the margins of cavities.

REVIEW OF CURRENT DENTAL LITERATURE

[*American Journal of Medical Sciences*,
Philadelphia, October 1918.]

The Teeth and Tonsils as Causative Factors in Arthritis. BY ROLAND HAMMOND.

Hammond presents a well-balanced study on this topic. It has been carried out during several years in collaboration with dentists

and ear, nose, and throat surgeons. It was attempted to ascertain if operations on the teeth and tonsils had produced in the joints, (1) cure, (2) relief of symptoms, (3) no improvement, and (4) aggravation of symptoms. It is often impossible to determine what element in the treatment is responsible for the improvement or cure. Appropriate treatment

for arthritis was instituted at the time the mouth and throat condition was being treated. When improvement is no more rapid than has been noticed for years under approved treatment for arthritis, it is natural to attribute the progress to such methods.

The total number of cases was 40. Twenty-nine of these showed disease conditions of the teeth and tonsils—(a) 12 were of the teeth alone, (b) 11 were of the tonsils alone, and (c) 6 were of both teeth and tonsils.

(a) Of these 12 cases 3 showed some improvement in the arthritis; 1 showed striking and immediate improvement; 3 improved after an interval of time had elapsed (1 of these last after several doses of autogenous vaccine); 2 were unimproved, all after the extraction of teeth; 1 was unimproved after treatment of pyorrhea alveolaris; 1 improved without operation, 1 could not be traced.

(c) Of the 6 cases in which both teeth and tonsils showed disease conditions—1 improved after extraction of teeth but relapsed later; 1 improved without operation; 1 unimproved after extraction of the teeth; 1 unimproved after extraction of the teeth and tonsillectomy; 1 unimproved where operations were not performed; 1 refused operation.

In analyzing the above cases it will be seen that there was but one case which showed immediate improvement, which could be classed as a cure, following extraction of teeth, and but one such result following tonsillectomy. (Compare cases 2 and 3 of Murray, a summary of which follows this review.) Many of these cases which are classed as improved showed the improvement in their general health rather than in a changed appearance of the joints. It has seemed fair to consider them as better, even if the improvement was slight. In these few cases the improvement following proper treatment of dental disease was more noticeable than the improvement following operations on diseased tonsils. In acute arthritis the probability of producing a cure or improvement by the removal of a supposed focus in the teeth or tonsils is greater than in cases in the chronic stage. This is parallel to Steinbugler's opinion in his consideration of oral infection to ocular disease. It is unreasonable to suppose that a restoration of function can be brought about in joints where extensive pathological changes have taken place.

In summary, there is undoubted improvement in numerous cases of arthritis following the removal of an abscessed tooth or a diseased tonsil or when a case of active pyorrhea has received proper treatment. On the contrary, many such cases are given similar careful treatment without affecting the progress of the joint condition in the slightest degree. It is probable that on the whole the pendulum has swung too far in the direction of the wholesale removal of teeth and tonsils.

One reason for the failure to obtain successful results in arthritis by treatment of dental and tonsillar disease is that the cases have been selected without knowledge of the exact pathological condition present in the organ in question. Grieves (*Jnl. N. D. A.*, August 1918, p. 788) recognizes this failure in the following terms: "This large group (the infectious phases of arthritis and rheumatism) responds less readily to ablation of oral foci than any disease here named—and evidently there exists some other etiologic factor. After fixed-joint changes occur, particularly in the old, it is useless to destroy the occlusion and deplete the patient, with no possible result; and it is most unfortunate indeed that this group was among the first where focal infection was related to disease."

Many apical abscesses in which nature has effected a cure by walling off the disease have been treated by extraction of teeth. This has resulted not only in the loss of valuable teeth, but has at times been the cause of a dissemination of the infection to other parts of the body, with dire results. Elsewhere in Hammond's article we find that—"Alveolar abscess is so prevalent as to be regarded as well-nigh universal, and yet it is not commonly associated with systemic infection. The protective forces surrounding the abscess are so efficient in the great majority of instances, and the lesion becomes so thoroughly walled off, that many thoughtful physicians and dentists deny the possibility of this condition becoming a focus of infection except on rare occasions." For a very similar view, see the last two paragraphs of Howe's article (*Jnl. N. D. A.*, October 1918.) While clinically this attitude may be justified, still from what is known of infection and the histology of the infected regions around tooth apices, one must hesitate before placing too much reliance in this "walling-off" process.

[*Canadian Medical Association Journal*,
Toronto, November 1918.]

Mouth Infections as a Source of Systemic Disease. BY B. A. MURRAY.

Case 1, woman of forty-five years, pernicious anemia. A number of teeth "fairly floating in pus"; apical alveolar abscesses also were found. Five of the worst teeth were extracted; the remainder underwent treatment during two months. The patient had improved within one month of the extraction, and within six months was able to resume her ordinary duties. After two years, there was no evidence of relapse. In this instance it is unfortunate that Murray did not report the blood pictures throughout the course of his observation of this case.

Case 2, woman of forty years, arthritis, especially of finger joints; could open and close hands only with difficulty. All the teeth were affected by pyorrhea; also two or three chronic alveolar abscesses without fistulæ were found. Surgical amputation of the affected roots and treatment of the pyorrhea were instituted. Within three months all evidence of arthritis had disappeared. Since then four years have elapsed with no return.

Case 3, man, suffering from antral engorgement arising from an abscess on the mesio-buccal root of the left maxillary second molar. The condition readily responded to treatment, clearing up a bad case of rheumatism.

[*Journal of the American Medical Association*,
October 19, 1918.]

Relationship of Focal Infection to Certain Dermatoses. BY M. L. RAVITCH AND S. A. STEINBERG.

No definite case histories are included in this report, which, however, seems to be based on considerable clinical observation. In dermatoses, these authors have made it a point to inquire about previous attacks of sore-throat, tonsillitis, pyorrhea, abscesses in the mouth, antrum and sinus infections, pain around the joints or in muscle, nerve, or tendon, endocarditis, pericarditis, varicose ulcers, appendicitis, and similar infections. Unfortunately the inquiry seems generally to have been verbal rather than physical.

These authors tentatively summarize what they have gathered from their own observations, the observations of other dermatolo-

gists, correlated material from internal medicine and other specialties, and the reports of pathologists and bacteriologists, under eight headings. The following paragraphs group the suggestions most pertinent to the dental aspects of focal infection:

We must remember the large percentage of people who have one or more forms of focal infection, and not accept a certain number of coincidental cases as proof.

Though we acknowledge other ways than direct infection of the skin by which focal infections may be causative of dermatoses, still we must not assume, without direct proof, a hypothetic power of focal infections to cause such a variety of reactions as has been mentioned in this connection.

Focal infections are causative of a small percentage of such dermatoses as the erythemas, urticarias, purpuras, and perhaps herpes zoster.

Some cases of the dermatoses just mentioned, which have lesions identical with the conditions referred to, are not directly or indirectly due to focal infections.

We can see no relationship between focal infection and such dermatoses as psoriasis, lichen planus (*vide infra*, Chipman, who associates this condition with "infectious foci"), pernio, acne, vitiligo, scleroderma, and alopecia areata.

[*Journal of the American Medical Association*,
October 19, 1918.]

Etiology of Lichen Planus. BY ERNEST DWIGHT CHIPMAN.

A preliminary report of Chipman's work appeared in the DENTAL COSMOS for September 1918, p. 836. The purpose of the present paper is to suggest the view that lichen planus may result from systemic toxemia or bacteremia, the origin of which is most often, if not always, in the teeth. This view is contrary to that held by Ravitch and Steinberg (*supra*).

Eight case histories are briefly given, in all of which oral infection was present, but in only two of which might the data establish more than a coincidence. In these two cases, removal of the oral infection was followed by the disappearance of the cutaneous lesions. In fact, Chipman concludes that in the study of a limited number of cases the only constant factor was tooth infection. In the dis-

cussion, he held—"As to lichen planus, I am not claiming that focal infection is a definite etiologic factor in this disease, but that it has been present in all the cases that I have seen."

Chipman is very skeptical as to the ability of the dentist deciding whether oral infection be present or absent. He places great reliance on roentgenograms. He inclines to Novitsky's view that any dead tooth left in the body will sooner or later become a source of local or systemic infection, and favors Novitsky's technique for the removal of dead teeth (*DENTAL COSMOS*, 1917, p. 1264).

[*Medical Record*, New York City, November 23, 1918.]

Gingival Septico-pyemia. BY W. F. DUTTON.

This is a local condition of the gums which rapidly becomes constitutional, and is characterized by chills, fever, great prostration, hypertrophic, spongy, suppurating, and hemorrhagic gums, rapid hemolysis, acute nephritis, hemophilia, coma, and death. The predominant etiological factors are pyorrhea alveolaris, traumatism, gingivitis, and alveolar abscess. It is an infectious disease—staphylococci, pneumococci, the bacteria of diphtheria, Vincent's organisms, streptococci, actinomycetes, etc. The prognosis is grave. Acute cases end fatally in three to five days. Subacute cases succumb within two to eight weeks. Two cases which ended fatally are described in detail. The treatment, whenever practicable, includes removal of or thorough drainage from the focus of infection.

[*British Medical Journal*, July 27, 1918.]

Treatment of Acute Septic Gingivitis. BY PERCY EDGELOW.

By this title the author refers to the not uncommon infection with Vincent's organisms. His treatment is described as follows: There is a thorough rinsing of the mouth with an iodine wash. Tiny pellets of cotton, soaked in camphor and phenol (equal parts), are applied well up into each interdental space for a few minutes. This quickly eases the pain arising from any instrumentation. A fresh paste (equal parts of thymol, dried alum, and zinc oxid with the oily camphor-phenol mixture) is carefully packed into the gingival spaces and around the necks of the

teeth, beneath the edges of the gums, and allowed to remain there. A mouthwash of "sanitas" is directed to be used after eating. Contrary to Colyer's method (see the following review) the use of the toothbrush is forbidden during treatment. The paste is applied locally every other day for ten days or so. A decided amelioration is usually noticed after two or three applications. When the gums are returning to health, a simple astringent mouthwash of alum and phenol is used. To prevent recurrence the patient is directed to paint the gums every other day with simple tincture of iodine, and to be particularly careful in maintaining a sanitary condition of his toothbrush.

[*British Medical Journal*, October 12, 1918.]

Acute Ulcerative Gingivitis. BY CLAUDE G. COLYER.

The title refers to Vincent's infection of the gums, that clinical entity known as "trench gum." This is an excellent paper, whose general plan and trend are quite similar to the article by Barker and Miller (*DENTAL COSMOS*, 1918, p. 1160).

Colyer's statistics seem to show that the condition is present in about 0.3 per cent. of men behind the line, and in 0.7 per cent. of those returning from the trenches. He summarizes as follows:

(1) Severe cases of acute ulcerative gingivitis represent 0.65 per cent. of all men reporting sick on account of their teeth.

(2) Only a small proportion of men suffering from the condition report sick until the pain becomes severe and there is considerable ulceration.

(3) Significant points affecting the army in connection with this disease are its contagious character, the disability produced, and the subsequent loss of teeth unless treated early.

(4) The average duration of treatment in first attacks is ten days, provided treatment is rigorous.

(5) Relapses are common, and probably chiefly due to inefficient treatment or too early discharge.

(6) The treatment is laborious, and personal daily treatment by a dental officer is required for each case.

General treatment: The patient is admitted to the hospital. Light diet is given for the first two days, but ordinary hospital diet is

substituted as soon as possible; smoking is forbidden.

Local treatment: (1) All slough is scraped away with a large spoon-shaped excavator. (2) The remaining débris is washed away with a water syringe, being sure to wash well between the teeth, using a concentrated solution of thymol in water; or eusol. (3) The tartar is scaled from the necks of the teeth; the gums dried, and (4) swabbed with a 5 per cent. solution of silver nitrate, which is allowed to remain a minute or two, then the patient rinses out his mouth with water or the thymol solution.

For subsequent treatment a mouthwash of thymol-water every two hours throughout the day is continued until all the ulcers have a clean, granulating surface (usually in four or five days); then less frequently, but not less than three times a day. The application of silver nitrate is discontinued, but the syringing out of the interdental spaces is persisted in. All roots and septic teeth are extracted, and all necessary fillings are completed as soon as the ulcers commence to heal. Glycerin and tannic acid is rubbed into the gums daily after discontinuing the silver nitrate. Throughout the treatment the patients brush the teeth vertically, especially to clean out the interdental spaces.

When it is a question of the treatment of chronic cases, any attempt to save teeth in the affected area is useless. The marked destruction of bone or a history of several attacks extending over a period of several months necessitates the extraction of the affected teeth. Before this is done the mouth should be rendered comparatively clean—two or three days' treatment as above usually suffices. Local anesthetics must on no account be used in these cases.

[*Archives of Ophthalmology*, New Rochelle, N. Y., March 1918.]

Dental Infection and Eye Diseases. BY W. F. C. STEINBUGLER.

This is a more elaborate study along the same lines as an earlier paper of Steinbugler's (*DENTAL COSMOS*, 1917, p. 1266). In all, fifty-three cases were examined, including sixteen different ocular affections. The routine treatment of cases where other than oral infections are excluded was to have the teeth radiographed, the blood examined—the

streptococcus complement-fixation test being employed—the teeth treated and if necessary extracted, and a vaccine prepared from the culture obtained at the time of extraction. The author, as in the earlier paper, emphasizes that it is logical to conclude that the infection is carried either via the lymphatics or through osseous channels, rather than via the blood stream.

The following are the conclusions which exhibit a dental aspect: (1) Dental infection does not present a definite clinical entity, although it is most often seen in the form of a low-grade chronic infection involving the iris, choroid, and ciliary body. (5) In acute cases a mixed infection is the rule, the streptococcus viridans being most often associated with a staphylococcus, whereas in chronic cases the former organism alone is common. (6) The streptococcus complement-fixation test (*vide* Potter, *DENTAL COSMOS*, 1918, p. 450) has not given satisfactory results, the findings not being consistent with the clinical picture. (7) Vaccine treatment has been disappointing. (8) The factors most concerned in the cure or improvement of these cases were the extraction of the offending teeth and the resulting drainage of the infected pockets.

As might be expected, the cases which showed the most benefit as the result of the dental treatment were acute conditions. Of the 24 acute cases, 16 per cent. were cured, 75 per cent. improved, and but 8 per cent. showed no improvement. On the other hand, of the 29 chronic cases, 10 per cent. were cured, 30 per cent. improved, and 58 per cent. showed no improvement.

[*Lancet*, London, October 5, 1918.]

Abnormal Conditions of Enamel in Cases of Malnutrition. BY J. LAWSON DICK.

The data for this report was furnished by the examination of 403 children (A) eleven years of age and over; of these 281 (B) on the basis of social stratum were very poorly nourished, while 122 (C) by the same standard were well nourished. Carious conditions have not been dealt with in the following figures. The abnormal conditions of the enamel which have been included are the following: (1) Typical hypoplasia (almost pathognomonic of rachitis), (2) honeycombed teeth. (3) horizontal bands of thickened enamel and

transverse grooves in the enamel (indicative of acute illnesses of a more or less prolonged nature), (4) chalky appearance of the enamel, and (5) brown lines of Retzius (for a somewhat similar interpretation and extensive study of these "lines," see Asper, *Schweizer Vierteljahrschr. f. Zahnheilk.*, 1916, p. 275.)

According to the groups, A, B, and C of the first sentence of this abstract, Dick offers the following statistics:

	A	B	C
Enamel normal...	67.5 p.c.	60 p.c.	87 p.c.
Enamel defective.	32.5	40	13

Placing the frequency of occurrence in the poor-class and in the better-class children side by side, the following is the result:

	B	C
Opaque or chalky enamel...	28.5 p.c.	9.0 p.c.
Brown lines of Retzius ...	13.0	(1 case)
Hypoplasia	8.5	5.0
Honeycombed teeth	2.5	0.0

Of the 114 cases with defective enamel in group B, there was found—

Chalky enamel	70.0 p.c.
Brown lines of Retzius	33.0
Typical hypoplasia	21.0
Honeycombed teeth	6.0

It is important to note that in hypoplasia and in cases where the chalky patches and the brown lines of Retzius were found, the teeth which suffered chiefly were (1) first incisors, (2) second incisors, and (3) canines. From reference to the calcification periods of the enamel, it appears that these defects are manifestations of nutritional defects affecting the child in the vast majority of cases some time during the first two years of life.

[*Journal of the American Medical Association*, November 23, 1918.]

Multiple Infections: A Study of the Relation of One Infection to Another. By WILLIAM W. DUKE.

This article is an amplification of one phase of focal infection, upon which Duke had previously touched in his monograph "Oral Sepsis in Relationship to Systemic Disease" (*DENTAL COSMOS*, July 1918, p. 627). Considerable clinical data has been considered. The conclusions to which Duke has been led follow:

(1) When a person has several infections, each may increase the severity of the others,

whether due to the same or different infecting organisms.

(2) Acute exacerbation of one chronic infection may stir up other apparently latent infections into activity.

(3) The removal of one infection may under favorable conditions be followed by spontaneous healing or improvement in others.

(4) If minor infections are properly taken care of, those that appear serious may yield more easily to treatment.

(5) Chronic sepsis exerts a serious influence on the course of tabes dorsalis, and its removal is frequently followed by amelioration in the symptoms of this disease.

The value of Duke's thesis lies in calling needed attention to an aspect of oral infection quite distinct from its metastatic possibilities, but nevertheless apparently of great importance.

[*New York Medical Journal*, December 21, 1918.]

Thyroid Hormone and Its Relation to Other Ductless Glands.

E. C. Kendall (*Endocrinology*, April-June 1918) describes how the active substance of the thyroid has been isolated and analyzed, its empirical and structural formulæ determined, its synthesis completed, and its physiological action studied in a large number of patients at the Mayo Clinic. In considering the rôle of the other ductless glands of the body, Kendall states that they assume positions secondary in importance to the thyroid, and that their part may be preparing the various metabolites for their final action with thyroxin (the active constituent of the thyroid), with the production of energy. In addition to this duty the task of taking care of by-products and elaborating other substances must be accomplished by some agent in the body, possibly the parathyroids and others of the ductless glands. A detailed description of the structural formula of thyroxin is given. It contains an indol group with the iodins attached to the benzene ring, and on the carbon atom adjacent to the amino group of the indol ring there is an oxygen atom. The physiological activity of the substance is produced by the CO.NH groups. In explaining the action of iodine in the compound the theory is presented that it renders the active groups more reactive.

PERISCOPE

Contour of the Arch.—Before extracting upper anterior teeth, especially cuspids, for bridges it is often beneficial to take an impression and run up a model of the teeth and gums. By so doing one will find the model a valuable aid in arranging the teeth on the bridge.—W. O. FELLMAN, *Dental Review*.

To Prevent Inaccuracy While Setting Up Teeth.—When making a denture, inaccuracy often arises because the porcelain of the teeth, while setting them up, is harder than the plaster of the opposing model, wears it off, and this causes the tooth to occupy an incorrect position. This can largely and very easily be overcome by painting the opposing plaster teeth, before setting up, with shellac or iodine. As soon as the porcelain wears the plaster down it will show up in white spots, and caution the dentist to be careful.—F. VAN MINDEN, *Dental Review*.

Limitations of the Radiograph in Diagnosing Dental Lesions.—The limitations of radiography as a means of diagnosing dental lesions are of course familiar to all who have used it. Some of the early stages of inflammation will not show up; one may not be able to state whether a certain area is an active focus of infection or whether another is healed to nature's satisfaction; but nevertheless, in spite of these limitations, radiography is a valuable addition to the diagnostic armamentarium of the dental profession. In the illumination of those hidden foci of disease, unsuspected and undemonstrable by other methods, roentgenology has a proud achievement which, indeed, may be included as one of its most beneficial contributions to medical science.—GEO. F. THOMAS, *Dental Summary*.

Repairing Vulcanite Dentures.—Repeated vulcanizing for repairs will soon cause a vulcanite plate to become brittle and useless. I find it better in many cases to substitute new rubber for the whole denture rather than to keep on repairing a plate. I proceed as follows: Make a correct model of the denture, remove the plate from the model, and cut into sections with a saw. I usually cut

the vault of the plate out in one piece in the case of a full upper, and the remaining part of the plate in from four to six pieces (this is done in such a way as to facilitate parting in the flask). I then re-assemble the parts correctly on the model with a small amount of wax. The case is then treated in the same way as a waxed-up denture: invest, separate, heat up the flask, and remove sections of vulcanite, leaving the teeth embedded, and pack in the usual way. This procedure takes very little longer than an extensive repair, you will get probably three times the fee, and will impress your patient with the permanency of your work.—A. G. SALISBURY, *Dental Review*.

The Anatomical Articulator.—One word regarding the so-called anatomical articulator, and where its real place is in prosthetic dentistry. I am strongly of the opinion that we have been trying to mystify ourselves in the past, and have been looking through the wrong end of the telescope in our effort to get at the facts.

As has been said, the bony structures, the articulating and functioning process of the maxilla and mandible, differ so widely in each individual case that it would be unscientific, to say the least, to try to place every one upon the same basis, inasmuch as each patient brings with him his own truly anatomical articulator. Why not make use of it to our own end? The only thing we demand of an articulator is that it maintains during the absence of the patient that which we have attained directly from the mouth of the individual.

I believe Dr. Hall's articulator will reproduce every movement the patient is capable of making, and some that cannot be made by a particular mandible. Furthermore, it is to me the pleasantest instrument upon which to work out the problem of articulation, on account of its great simplicity. The mystifying face-bow and the search for a condyle path is beginning at the wrong end of the procedure, and completely ignores the importance of the occlusal planes which are peculiar to the individual patient.—W. M. RANDALL, *Journ. N. D. A.*

Gold Foil Fillings.—Better adaptation may be obtained by gold foil than with any other material. By proper manipulation it can be built against the cavity walls with much force, gradually spreading the dentin, which is very elastic, and securing a permanent gripping of the tooth to the filling, making a perfect joint that will resist the entrance of moisture or bacteria, prevent discoloration of the tooth, and afford protection to the dental pulp. It is this quality in gold foil with its relation to the quality of elasticity and strength of dentin, or the mutual relation of these in the two substances combined with the indestructibility of gold, that renders gold foil so pre-eminent as a filling material. No other known filling material can be so worked against the walls of a cavity as to make such use of the sustaining power of the elasticity of the dentin. I think the great Architect of the universe may have had this material in mind for filling teeth, so harmonious is the relationship of the physical qualities of these two substances in conjunction with each other.—G. B. BAIRD, *Dental Review*.

Focal Infections and Systemic Diseases.

—I am more than ever convinced that a large majority of systemic diseases which are attributed to improperly treated teeth are the result of focal infections, due to lack of proper knowledge of the lymphatics in the throat, nose, and the accessory sinuses, and as these conditions are only the occasional cause of trouble, lasting for a few days, and occurring possibly three or four times in a year, the parent is inclined to feel that the child will outgrow the trouble. As a matter of fact, these attacks of tonsillitis often become less frequent, but the crypts in the tonsils remain, and are a continual source of infection which enters the blood stream in practically the same manner as do infections from abscessed areas in the region of the apices of the roots of teeth. I do not wish it to be understood that I would question the fact that infected areas around the apices of the roots of teeth will frequently be the cause of a lesion in some other part of the body, but I do wish to emphasize that there are other structures which I dare say are ten times more liable to cause the same kind of infection, and before we condemn the dental profession and advocate the ruthless extraction of infected teeth, it would be well to ask our brothers of the medical profession to devote more time to the care of the nose, throat, and accessory sinuses.—J. K. CONROY, *Dental Review*.

The Radiograph and Infectious Areas.

Whether or not the roentgenogram can be relied on to tell the condition present at the apical end of a root is not established. While some doubt has been expressed as to whether there is or is not an abscess when the roentgenogram indicates absorption, there remains to be shown whether, when the roentgenogram does not show absorption, there actually is no pathology. I have been impressed with this unreliability. Experiments which I carried on to establish whether conservative (electrolytic) treatment is sufficient to cure pathologic conditions at the apices of roots, or whether apicoectomy is necessary to obliterate the infection, have resulted in the following: First, on teeth which were treated conservatively and which in the roentgenogram showed no absorption, apicoectomy was performed several months after treatment, and the cultures have yielded streptococci. Second, the same areas were cultured four or six months later under the same conditions as for doing a root amputation, and although the roentgenogram indicated absorption (due to repeated surgical interference), cultures made from scrapings yielded no bacterial growth. To my mind this shows that lack of absorption in the roentgenogram does not indicate sterility, nor does the presence of absorption indicate infection at the end or around the root of the tooth.—ARTHUR ZENTLER, *Dental Summary*.

Some Advantages of the Indirect Method of Making Inlays.

—Inlays that apparently will not go halfway to place without swaging usually can be driven home without fracturing the amalgam model, providing good-size models are made; and by using copper amalgam one can be very prodigal, as it can be used over many times without much deterioration. Such deterioration as occurs is caused by dirt, plaster, and modeling compound being mixed with the amalgam, and can be cleaned out by rubbing the soft amalgam thoroughly in the mortar in an alcohol bath several times.

After swaging the inlay to place it is trimmed roughly and tried in the cavity of the tooth itself for approximal contact. When this is correct it is replaced in the model, the sprue is removed, and the occlusal surface (where the sprue was attached), is trimmed, then replaced in the tooth for testing the occlusal contact. When correct it is replaced in the amalgam model and finished completely. Usually an inlay so made slips easily without friction to its place in the tooth, as an inlay should—the fact that one is hard to force

to place is almost conclusive evidence that it does not properly fit, as, for instance, a globule or two of gold on its surface will cause it to stick very tightly or make it impossible to be driven home, but is no evidence of a good adaptation. In swaging, small globules actually are flattened out or rubbed off, and all the strain of forcing to place is in the model and not in the natural tooth.

It is much better that an ill-fitting inlay break a piece of amalgam and the process be gone all over again than that it split a natural tooth and possibly ruin it—and such things have happened. All the grinding, sand-papering, and finishing is done out of the mouth.—WILLIS A. COSTON, *Dental Summary*.

The Patient as a Factor in Anesthesia.

—Unless we can examine the heart by a stethoscope, *i.e.* auscultate, we can only guess at circulatory conditions, but we can learn much by inspection and palpation. The color as indicative of blood conditions has been referred to already, and let us never forget that true anemia is always a sign which points to danger under anesthesia. Next we have the pulse to guide us. Three fingers should be placed on the wrist where the radial artery can be felt, and pressure made on the vessel by the two fingers on the heart side: the third finger tells us when the artery is temporarily obliterated by this pressure, and so we learn roughly what is the arterial blood pressure, and whether the vessel is hard and cordy or compressible. A high blood pressure is associated with arterio-sclerosis and disease of the vascular walls which makes them liable to rupture, when apoplexy may result. In every case both radial pulses should be examined, as the vessels may differ. An intermittent pulse, if regularly intermittent, may be normal to the individual, but an irregular pulse is commonly associated with disease of the mitral valves. A collapsing pulse usually means aortic disease. The rapidity of pulse commonly has only slight significance, as it may arise from nervousness or fear, but if fear can be eliminated a persistently rapid pulse—tachycardia—and an abnormally slow pulse—bradycardia—indicate dangerous conditions, and should spell caution to the administrator. It need not follow that a patient who has had endocarditis and its sequelæ is a bad subject for gas, since even if a murmur is present, provided the heart is performing its work efficiently, it has probably recovered its tone. Briefly we may take it that if there is nothing in the breathing to indicate impediment to the entry of air into the lungs, and if the heart is able to propel blood regularly through the vascular system,

the patient will take nitrous oxid with impunity, although if any minor difficulties are present we must be particularly careful to prevent any asphyxial complications being developed during the administration.—DUDLEY BUXTON, *Brit. Journ. of Dental Science*.

Inflammation.—It must be clearly understood that inflammation is a reaction of the tissues, and as such is a wholly beneficent thing. In olden days physicians had great ideas about “reducing inflammation,” not recognizing that inflammation is the friend of the patient. The area of inflammation is the battlefield between the invading germs and the defensive mechanisms of the body. The redness is due to the dilatation of the blood-vessels in order that a larger supply of blood may be carried to the scene of action; the swelling is due to an outpouring of serum and leucocytes, the two great anti-bacterial agents. These leucocytes swarm to meet the invader, and literally try to block his path with their bodies, and the pus which flows from a seriously infected wound represents the bodies of innumerable leucocytes, mostly slain in the conflict, but some still living. The pain is due to nerve endings which inhabit the war zone, and share the usual fate which non-combatants meet with under these circumstances. The recovery from infection is always due to the tissue resistance alone—the surgeon may do something to aid it, but recovery has very often ensued in spite of, and not on account of his interference. When once germs have penetrated the tissues, we have no means of getting rid of them, except, perhaps, by cutting out the infected tissues. Similarly, the general symptoms which are the consequence of bacterial infection are probably likewise of a protective nature. Such, for instance, is the rise of bodily temperature. Some years ago physicians took much pains in attacking the temperature and trying to “get it down”; now it is practically certain that the rise of temperature is in some way connected with the mechanism of resistance to disease. Pneumonia is a disease usually accompanied by a high temperature; if this rise of temperature does not occur the patient practically always dies. The medical profession has on many occasions vigorously attacked not the cause of the disease, but the very means which nature was using to protect the patient. I think it was Voltaire who said that “the function of the physician was to amuse the patient while nature cured him,” but the physician often has gone one better, and put a spoke in nature’s wheel.—ARTHUR S. VALLACK, *Commonwealth Dental Review*.

OBITUARY

Dr. John Henry Meyer.

DIED, at his home in New York City, Saturday, October 19, 1918, JOHN HENRY MEYER, D.D.S.

Dr. Meyer was born in Herford, Westphalia, Germany, the son of William and Wilhelmina Meyer. After attending the public schools of his native town until he was sixteen years of age, he came to the United States.

In 1866 he entered the office of Dr. John Allen and Son, the pioneers in continuous-gum work, as a student of dentistry, where he remained as a student and practitioner for ten years, when he engaged in private practice. Later he completed a course in the Pennsylvania College of Dental Surgery, from which institution he was graduated in 1883 with the degree of Doctor of Dental Surgery. His practice was almost entirely confined to prosthetic work. Dr. Meyer lectured in the Baltimore Dental College for several years. He was the inventor of several useful appliances, and the author of a number of scientific contributions to dentistry.

In March 1894 Dr. Meyer was metal expert in the Circuit Court of the United States in the suit of the Rynear Crown Co. against the George Evans Crown Co.; the latter won the suit on the testimony of Dr. Meyer.

Dr. Meyer was a member of the First District Dental Society, which he served as treasurer and chairman of the clinic committee; he was also a member of the New York State Dental Society. He was past-master of the Metropolitan Lodge, F. and A. M., also ex-treasurer of the Ancient Chapter R. A. M., also high-priest and member of the Masonic Veterans.

In 1871 Dr. Meyer enlisted in the Ninth N. Y. Regiment, in which he served until 1884 as orderly sergeant, and is now a member of the veteran corps.

Dr. Meyer was an enthusiastic fancier of fine dogs. He was one of the organizers of the Gordon Setter field trials at Lexington, N. C., and was president of the Gordon Setter

Club. His kennel was known as the Beaumont Kennel, located in Northville, N. J., and imported a number of thoroughbred dogs.

In 1883 the doctor married Miss Katherine Jackson of New York, who with one child, Miss Florence Meyer, survives him.

Lieut.-Com'r Arthur A. Rehm,

DENTAL SURGEON UNITED STATES NAVY.

DIED, October 20, 1918, of pneumonia, in the Marine Hospital, Washington, D. C., ARTHUR A. REHM, D.D.S.

Lieut.-Commander Rehm was born in Meriden, Conn., October 16, 1886. He was educated in the public schools of Meriden and by private tutor. He was graduated from the Baltimore Dental College with honors in 1913. He passed his examinations for dental surgeon and was commissioned lieutenant junior grade February 13, 1914, with instructions to proceed to Norfolk navy yard. After several months he was ordered to the U. S. S. "Dixie," aboard which he served in several cruises to the West Indies. He also served for one cruise aboard the U. S. S. "Seattle," and when the U. S. S. "Melville" was made mother ship to the torpedo boats and flagship for Admiral Sims, Dr. Rehm was ordered to the Melville as dental surgeon. At the entrance of the United States into the war, he was ordered overseas with the first squadron of torpedo boats, and was the only dental surgeon for some time at Queenstown.

After serving overseas for a year and three months he was ordered home to organize the Bureau of Dental Supplies and take his examination for lieutenant-commander. While in Washington on business he was stricken with pneumonia, and died at the Marine Hospital after a few days' illness.

He was buried at his birthplace with the full naval honors due his rank. He was an honor to his country and to his profession, a most modest man, and by those who were fortunate enough to know him he was most beloved.

"In Memoriam" Resolutions.**Dr. Edward M. Guthrie.**

THE following resolutions on the death of Dr. Guthrie were passed by the Harvard Odontological Society:

Whereas, Almighty God in his infinite wisdom has seen fit to remove from us our esteemed brother practitioner and fellow member EDWARD M. GUTHRIE; and

Whereas, he was a man among the younger members of our profession who stood for the best things in dentistry, and by his lovable nature and cheery disposition endeared himself to all who knew him; therefore be it

RESOLVED, That we, the members of the Harvard Odontological Society, express our heartfelt sorrow at his early death, and extend to his family our deepest sympathy in their great bereavement; and be it also

RESOLVED, That these resolutions be recorded by our secretary, a copy sent to the bereaved family, and that they be published in the DENTAL COSMOS.

GEORGE H. LAPPEN,
J. WILLIAM O'CONNELL,
ERNEST E. CARLE,
Committee.

Dr. Thos. G. Aller, Jr.

THE following resolutions on the death of Dr. Thos. G. Aller, Jr., were passed by the Academy of Stomatology of Philadelphia, at its annual meeting, Thursday, December 19, 1918:

Whereas, Dr. THOMAS G. ALLER has been stricken from his loyal membership in the Academy of Stomatology by death, after years of active professional service in our midst; and

Whereas, it is the desire of this society to record appreciation of his affiliation with us, and the esteem in which we held him; therefore be it

RESOLVED, That we, the members of the Academy of Stomatology of Philadelphia, feeling deeply the loss we have sustained, hereby express our sorrow and our sympathy for the bereaved family; and be it further

RESOLVED, That these resolutions be placed upon the minutes of this society, and that a copy be sent to the family.

J. C. SALVAS,
R. HAMILL D. SWING,
E. L. KANAGA,
Committee.

ARMY AND NAVY DENTAL NEWS

Annual Report of the Surgeon-general.

THE annual report of the Surgeon-general for 1918 has just been issued. It contains a comparative study of the health of the army, 1820-1917; an account of the health of the mobilization camps and of the army by countries; a consideration of the principal epidemics in the camps, and a discussion of fractures and operations. Nearly 200 pages are devoted to the special activities of the Medical department: with the American Expeditionary forces, and in the divisions of sanitation, hospitals, supplies, laboratories, and infectious diseases, internal medicine, general surgery, orthopedics, head surgery, neurology and psychiatry, psychology, food, and the dental and veterinary corps. In addition to the usual tables of illness, discharge for disability, and death, there are given tables of

battle wounds and operations, of complications of various diseases, and of case mortality. The text is illustrated by seventy-three charts. Altogether the report is a study of health and morbidity in an army of over 1,500,000 men, for the most part yet in the period of training. It should be of interest to epidemiologists, vital statisticians, and army medical men.—*New York Medical Journal.*

Army Medical Corps.

REPRESENTATIVE DYER proposes in H. R. 13,344 to amend the National Defense Act, as follows:

SEC. 1. That the Medical department of the army shall consist of one Surgeon-general with the rank of major-general, who shall be chief of said department; assistant surgeon-

generals in the ratio of one-half of one per centum of the total number of officers of the Medical department provided by law, the assistant surgeon-generals to be equally distributed in the grades of major-general and brigadier-general of the medical corps, the dental corps, and the veterinary corps authorized by law, the commissioned officers of which shall be citizens of the United States, the enlisted force of the Medical department of the army as now provided by law.

SEC. 2. That commissioned officers of the medical corps below the rank of brigadier-general shall be proportionately distributed in the several grades as now provided by law for the medical corps of the navy.

SEC. 3. That hereafter the President shall be authorized to fill any vacancy that may occur in the commissioned *personnel* of the permanent establishment of the Medical department of the army of the United States by selection from the medical officers of the United States army of not less than one year's continuous active service: *Provided*, That the selection shall be upon the efficiency rating and satisfactory examination of the officer, and where two or more officers are of equal rating selection will favor the one of longest service in the United States army, Volunteer army, National guard, officers' reserve corps, or National army: *Provided further*, That the officers so selected will be commissioned without loss of rank in the permanent establishment of the Medical department of the army of the United States, and such officers so commissioned shall be entitled to all pay, promotion, and allowances of officers of like rank in the permanent establishment of the army of the United States, excepting that the rate of retirement pay shall be one-thirtieth of the present retirement pay, as now prescribed by law, for each year's service as enlisted man, or commissioned officer, or the total of such services in the United States army, Volunteer army, National guard, officers' reserve corps, National army, dental corps, dental reserve, or enlisted *personnel* in the army or National guard in any of the various departments of the army of the United States: *And provided further*, That at the age now prescribed by law for retirement an officer to receive retirement pay shall have not less than fifteen years' service in any or all branches enumerated in this

act: *And provided further*, That the provisions of this act shall in like manner govern the filling hereafter of all vacancies in the dental corps of the United States army: *And provided further*, That the ratio of dental surgeons now and hereafter commissioned shall be two dental surgeons per thousand of enlisted strength of the army of the United States: *And provided further*, That all laws or parts of laws, in so far as they are inconsistent with the provisions of this act, are hereby repealed.—*Army and Navy Register*.

Assignments.

Army Dental Corps.

Week ending December 14th.

Maj. Shirley W. Bowles, to Detroit, Mich., general hospital 36, for duty.

Week ending December 21st.

Maj. Walter L. Reesman to western department for duty.

Maj. Emmett P. Varvel to Fort Des Moines, Iowa, general hospital 26, for duty.

Maj. Oscar G. Skelton to Washington, D. C., for duty in office of attending surgeon.

Week ending December 28th.

The following now on duty with division of purchase and storage, placed on unassigned list of Medical department and assigned for duty under direction of director of purchase and storage, purchase, storage, and traffic division, general staff, stations and duties to remain as at present, credit to be given the Medical department on its unassigned list for officers so transferred:

Lieut.-cols. J. R. Bernheim and Albert R. White.

Major J. C. King.

Week ending January 11th.

Maj. Guy P. Bannister to Washington for duty in office of attending surgeon.

Maj. George R. Tressel to Fort Slocum, N. Y., for duty.

Maj. Don G. Moore to Columbus Barracks, Ohio, for duty.

Majs. Harry B. Butler, Joseph D. Eby, and Albert J. T. Beatty to Walter Reed General Hospital, D. C., for duty.

Preparedness League of American Dentists.

ORGANIZED UNDER THE AUSPICES OF THE N. D. A.

Preparedness League Notes and News.

By R. OTTOLENGUI, *Publicity Committee.*

FROM THE PRESIDENT.

EXPANSION OF THE LEAGUE.

Our League has made a permanent place for itself. It has proven its usefulness to the dental profession and its necessity to the welfare of humanity. Its field of operation reaches wherever organized dentistry exists, and its public service may be felt to the extreme limits of civilization. Such is a brief outline of the field of our future endeavors. In expanding the activities of the League we desire, however, to lay down the following unvarying rules and principles, that no misconception of our aims may occur:

(1) The principle of the League is *service to Humanity.*

(2) Politics or promotion of personal interests *shall not be tolerated.*

(3) It is essentially an organization for public health service.

(4) Its activities shall not conflict with other dental organizations in any way.

(5) Its object shall be the co-ordination of all professional and public agencies which may thereby render better service for the common welfare of humanity.

(6) No officer or member of the League shall receive pay for services unless of such character as to be justifiable, and not without proper action by a quorum.

These principles must be strictly adhered to, or the organization cannot live.

At a meeting of more than 100 dentists at the Royal College of Dental Surgery, Toronto, Ont., December 19, 1918, a resolution was unanimously adopted for the appointment of a committee of Canadian and American dentists to meet in Buffalo, January 11, 1919, to formulate plans for an international organization, using the League plan as the basis. Our members will be informed of the results as early as possible, and final action will not be taken without the approval of those interested.

The wonderful power for good of such an organization cannot be estimated. It must be truly democratic and ever ready to extend

a helping hand wherever our rightful province may reach. It is impossible to outline the possibilities in a few words, but I refer you to the editorial by Dr. Kirk in the December DENTAL COSMOS; also that by Dr. Ottolengui in the December *Dental Items of Interest.*

The great opportunity for the dental profession is at hand, and a magnificent work is before us. We will accept the responsibility, with the Golden Rule as our guide, and endeavor to prove faithful to the trust. Big things are before the American public today. We must rise to the occasion and THINK big, ACT big, and DO big. It is up to us to see that our profession keeps pace with the leaders.

INSTRUCTION IN POST-BELLUM ORAL SURGERY AND PROSTHESIS.

The course of instruction given at the Royal College of Dental Surgery at Toronto in December was the first one given in conjunction with the League, and without doubt it proved to be the best such course thus far. The splendid faculty was composed of Lieut.-col. Guy Hume and Major E. W. Cummer, representing Canada, and Arthur E. Smith, D.D.S., M.D., of Chicago, and LeRoy S. Miner, M.D., D.M.D., Boston, representing the United States. This gave the meeting international significance and did much toward better relations of the profession on both sides of the border.

The military were largely represented in the class, numbering 104. Col. Clayton, Dental Surgeon-general of Canada; Col. W. H. Thompson, commandant for Ontario, and several other provincial commanders, were present, together with Deans Thornton of McGill University, Dubeau of Duval, and Webster of the Royal College. From the States came State Director Hallenberg, North Dakota; State Director McIntyre, Rhode Island; two League members from Nashville, Tenn., and many others scattered about the border states. Director-gen. Tracy, as well as President Beach, was also present to aid in making the gathering a great success. Great credit is due Dr. Wallace Secombe for his efforts

in making necessary arrangements. The course has set a standard for the League to strive to maintain.

The League wishes it distinctly understood that this is not a postgraduate course. It is to be known as a Course of Instruction in Post-War Oral Surgery and Prosthesis, to which it will be strictly confined. Bearing this fact in mind, one week of instruction is ample to cover the field except in special cases.

The course to be given in New York early in February will essentially have the same faculty. It was difficult to secure Col. Hume and Major Cummer, but this has been brought

about through the courtesy of Col. Clayton and Col. Thompson. We are deeply indebted to these gentlemen for their sympathetic co-operation.

The League hopes to pursue this object until the States and Canada have been well covered and our members are prepared to render efficient service to our injured soldiers. The fee of \$50 is divided equally among the instructors, after necessary expenses have been met, the League or the collaborating institution receiving nothing whatever.

If you are not a member of the League—join now. We need you and you need us.

J. W. BEACH, *President.*

Special Course in Post-War Prosthesis,

Oral Surgery, Fractures, Splints, Anesthesia, and Physical Diagnosis

TO BE HELD IN

NEW YORK CITY, FEBRUARY 3D TO FEBRUARY 8TH, INCL.

UNFORESEEN circumstances have made it necessary to postpone the New York Course in Post-War Oral Surgery and Prosthesis to the above date. This change makes it impossible for the Columbia University Dental Infirmary to accommodate us as planned, and headquarters will be at the Hotel Commodore, 42d st. and Lexington ave.

The faculty and teaching staff include the following names:

Lieut.-col. GUY G. HUME, officer in charge of dental service at Ontario Military Hospital, Orpington, England; Vice-president Congrès Dentaire Inter-alliés; Prof. of orthodontia, Royal College of Dental Surgeons.

Major W. E. CUMMER, in charge of special war prosthesis and facial restoration, Canadian Army Dental Corps, military district No. 2; Prof. prosthetic dentistry, Royal College of Dental Surgeons.

WAR PROSTHESIS—FRACTURES—SPLINTS.

M. I. SCHAMBERG, M.D., D.D.S., New York: Anesthesia and Oral Surgery.

LEROY S. MINER, M.D., D.M.D., Boston, asst. prof. oral surgery, Harvard University; Oral surgeon, Mass. General Hosp., Mass. Homeopathic Hosp., and Forsyth Infirmary for Children, Boston.

ORAL SURGERY AND PHYSICAL DIAGNOSIS.

TAIT MCKENZIE, M.D., Philadelphia: Facial Prosthesis.

FRED H. ALBEE, M.D., New York: Bone-grafting as Applied to Oral Surgery.

JAMES P. RUYL, D.D.S., New York: Surgical Treatment of the Jaws prior to Insertion of Dentures.

EDWARD KENNEDY, D.D.S., New York: Fractures and Splints.

Capt. H. S. DUNNING, M.D., D.D.S., New York, Columbia University Dental School, late of Amer. Exp. Forces: Radical Drainage of Comminuted Fractures; Epithelial Inlays as Applied to Oral Surgery.

OSTEO-PERIOSTEAL BONE GRAFT.

DUDLEY GUILFORD, D.D.S., Philadelphia: Splints and War Surgery.

Ethical dentists only will be enrolled as members of this class.

Those desiring to take this Course will be required to give all their time to it during this week.

Fee for the Course \$50.00.

For further information address THE PREPAREDNESS LEAGUE OF AMERICAN DENTISTS, 50 E. 42d st., New York City.

SOCIETY NOTES AND ANNOUNCEMENTS

NOTICES should reach the Office of the DENTAL COSMOS not later than the 11th or 12th of the month preceding that of publication.

American Society of Orthodontists.

THE nineteenth annual meeting of the American Society of Orthodontists will be held in St. Louis, Monday, Tuesday, and Wednesday, March 10, 11, and 12, 1919, with headquarters at the Planters Hotel. An excellent program is assured.

F. M. CASTO, *Sec'y*,
Cleveland, Ohio.

Minnesota State Dental Association.

THE Minnesota State Dental Association will hold its next annual session at St. Paul, Minn., February 6, 7, and 8, 1919.

A program of unusual interest is being prepared, and a cordial invitation is extended to all members of the National Dental Association to attend this meeting.

For information address

MAX E. ERNST, *Sec'y*,
1125 Lowry Bldg., St. Paul, Minn.

Vermont State Dental Society.

THE next annual meeting of the Vermont State Dental Society will be held in Burlington, Vt., March 19, 20, and 21, 1919.

P. E. MELLEN, *Sec'y*,
Middlebury, Vt.

Missouri State Dental Association.

THE 1919 meeting of the Missouri State Dental Association will be held in the new Hotel Statler, St. Louis, Mo., April 14, 15, and 16, 1919.

A very elaborate program is in preparation, and the St. Louis Dental Society, who will act as hosts, claim that this will be the banner meeting in the state.

H. F. D'OENCH, *President*,
1703 S. Grand ave., St. Louis, Mo.
J. F. WALLACE, *Sec'y*,
Canton, Mo.

Texas State Dental Society.

THE thirty-ninth annual convention of the Texas State Dental Society will be held at Waco, Texas, April 21 to 24, 1919.

Several men of national prominence will conduct the postgraduate feature of the meeting, which will supplement the program of papers and clinics by members of the society.

J. G. FIFE, *Sec'y*,
736 Wilson Bldg., Dallas, Texas.

Dewey School of Orthodontia.

ALUMNI SOCIETY.

THE Alumni Society of the Dewey School of Orthodontia will hold their next annual meeting in St. Louis, Mo., March 6, 7, and 8, 1919. The usual high standard of the meetings of this society will be maintained. All interested in orthodontia are welcome. Address communications to

GEORGE F. BURKE, *Sec'y*,
741-43 David Whitney Bldg., Detroit, Mich.

Philadelphia Dental College.

ALUMNI SOCIETY.

THE annual meeting of the Alumni Society of the Philadelphia Dental College (Temple University) will be held on Wednesday, April 16, 1919, in the College building, at 18th and Buttonwood sts. All members should be present.

FRANKLIN S. FLUCK.

CLASS OF 1914.

THE reunion of the class of 1914 of the Philadelphia Dental College will be held on Wednesday, April 16, 1919, in the College building, at 18th and Buttonwood sts.

All members who expect to attend the reunion will kindly communicate with

LEON A. HALPERN,
2438 N. 33d st., Philadelphia, Pa.

Illinois State Dental Society.

THE fifty-fifth annual meeting of the Illinois State Dental Society will be held in Peoria, Ill., May 13, 14, 15, and 16, 1919. The officers of the society are as follows: L. B. Torrence, president, Chester; G. D. Sitherwood, vice-president, Bloomington; J. P. Luthringer, secretary, 507 Jefferson Bldg., Peoria; T. L. Grisamore, treasurer, Chicago; G. H. Henderson, librarian, Chicago.

J. P. LUTHRINGER, *Sec'y*,
Peoria, Ill.

Dental Society of the State of New York.

THE Dental Society of the State of New York will hold its fifty-first annual meeting June 12, 13, and 14, 1919, at the Hotel Onondaga, Syracuse, N. Y. All ethical dentists residents of New York and those residing in adjoining states are cordially invited to be present at the sessions of the society.

Dr. A. C. Bickelhaupt, City Bank Bldg., Syracuse, N. Y., is chairman of the Exhibits Committee.

A. P. BURKHART, *Sec'y*,
52 Genesee st., Auburn, N. Y.

Forsyth Dental Hygienists' Alumnae Association.

THE annual meeting of the Forsyth Dental Hygienists' Alumnae Association was held at the Forsyth Dental Infirmary on November 26, 1918. The following officers were elected for the year 1919: Miss Geneva Walls, president; Miss Ida Green, vice-president; Miss Mildred Akerley, secretary; Miss Mary Jackson, treasurer; Miss Agnes Christie, editor.

New Jersey Board of Registration.

THE State Board of Registration and Examination in Dentistry of New Jersey will hold a special examination in the 2d Regiment Armory, Trenton, N. J., on March 3, 4, 5, 6, and 7, 1919. License fee, \$25; re-examination fee, \$10. Practical tests required: Insertion of an approximal gold filling, with approximating tooth in position, compound approximal amalgam filling, a silicate filling, practical test of the applicant's ability in oral prophylaxis, and preparation of a cavity for an inlay with wax pattern. Also the soldering of a bridge consisting of three or

more teeth exclusive of abutments, and one Richmond crown, which may be one of the abutments of the bridge; these must be struck from dies made from an impression of the mouth, and the articulating model, with the bridge, when soldered, must be submitted for inspection. An anatomical articulation of a full upper and lower set of teeth will also be required; teeth to be furnished by applicant. Wax bite properly trimmed and in place on models for inspection before setting up teeth.

Attention is directed to the following quotation from the dental law of New Jersey:

"Applicant shall present to said board a certificate from the Commissioner of Education of this state, showing that before entering a dental college he or she had obtained an academic education consisting of a four-year course of study in an approved public or private high school, or the equivalent thereof." In accordance with this law the secretary will issue application blanks only upon presentation of the required certificate from the Commissioner of Education, Statehouse, Trenton, N. J.

Note—Dental Radiography will be added to the list of theoretical examinations in June 1919.

Applications must be filed complete ten days before the date of the examinations. Address all communications for further particulars to

JOHN C. FORSYTH, *Sec'y*,
430 E. State st., Trenton, N. J.

Iowa Board of Examiners.

A SPECIAL meeting of the Iowa State Board of Dental Examiners for the examination of applicants will be held in Iowa City, Iowa, commencing March 10, 1919, at 9 A.M.

For further information address

J. A. WEST, *Sec'y*,
417 Utica Bldg., Des Moines, Iowa.

Massachusetts Board of Examiners.

A MEETING of the Massachusetts Board of Dental Examiners will be held in Boston, Mass., March 17 to 21, inclusive, 1919, for the examination of candidates for registration. All applications must be in the hands of the secretary on or before March 7th. For further information address

GEORGE H. PAYNE, *Sec'y*,
29 Commonwealth ave., Boston.



DR. S. H. GUILFORD.

THE DENTAL COSMOS

VOL. LXI.

MARCH 1919.

No. 3

ORIGINAL COMMUNICATIONS

The Radical Treatment of Focal Infections from a Military Point of View.

By Capt. ALONZO MILTON NODINE, D.D.S., A.R.C.,

CHIEF DENTAL OFFICER, AMERICAN RED CROSS IN GREAT BRITAIN; LATE ORAL AND DENTAL SURGEON, HÔPITAL FRANÇAIS DE NEW YORK, PASSY PAR VERON (YONNE); ORAL SURGEON AND DENTAL CONSULTANT, FRENCH HOSPITAL OF NEW YORK.

(Read before the American Dental Society, London, October 18, 1918.)

ARMY dentists endeavor to give the greatest amount of service to the greatest number of men. They endeavor to give this service safely, and in such a way that the result of their efforts may be a benefit and not a detriment. They endeavor to cure disease, and not merely to allay symptoms.

The dental officer has two great classes of dental infections to treat; those which affect the apical area, and those which affect the tissues surrounding the circumference of the tooth, or those infections which begin at the gum margin and work toward the apex. We shall discuss the second class first.

Those cases of the second class which we find in the army are due largely to irritation of some kind. Therefore it seems reasonable that the first step in the treatment of these cases should be the

removal of the irritation. In most cases where the infection is slight—those in which only shallow pockets have formed about the teeth—the removal of deposits, overhanging fillings, irritating crowns, etc., the polishing of the teeth and the painting of the gums with iodine, potassium iodid, and zinc iodid, with a liberal amount of aromatic sulfuric acid in the pockets, will accomplish much. After the second day another application of iodine, potassium iodid, and zinc iodid, and perhaps the application of sulfuric acid, together with the institution of gum massage or gum brushing, may be all that is necessary.

But the kind of infection which I have in mind is that in which the pockets are deep, the bone destroyed, the gums hypertrophied, swollen, slightly turbid, and from which pockets pus may be expressed

upon pressure. The main factor that keeps up the infection in these cases is the pocket due to bone destruction. As the pockets and destruction of bone are the result of the primary irritating cause producing the pockets, the treatment begins with a superficial cleaning of the teeth followed by surgical removal of the pocket. Novocain is injected either locally or for conduction anesthesia, and the loose gum is cut away down to the bone, one side of the mouth being treated at a time. After the gum is removed, the diseased tissue between the teeth is curetted out and the sharp rough bone between or around the teeth is smoothed off with curets or bone-cutting burs. The gums are then painted with iodine. The patient is instructed to use as a mouthwash or dentifrice, alcohol one part, vinegar one part, and water eight parts. This preparation, founded on the principle which Pickerill and Gies brought to our attention about five or six years ago, is one of the best for removing the sticky, transparent film precipitated upon teeth, under which infectious bacteria are held and upon which other materials are deposited. The patient uses this preparation as a dentifrice, at first gently brushing the gums and teeth, increasing the pressure as the gums heal and harden.

While waiting for the complete healing of the gums, the deposits and other irritants which previously were hidden will be brought to view and may be removed. The gums should be painted every other day with iodine, and when necessary granulation stimulated with nitrate of silver.

The results of this radical treatment are: All necrotic tissue may be removed, all pockets are eliminated, and the gum heals up slightly in advance of the incision; the gum clings tightly to the teeth, and sound healthy gum comes in on the floor of the interproximal space so that with careful brushing and flushing these spaces may be kept clean.

After the initial work upon such a case is performed, two to three grains of calomel are given for two nights, followed by a saline cathartic, with a re-

striction of the diet to vegetables and milk for a few days.

The patient may be inconvenienced for a few days after this operation, and the teeth may be quite sensitive for awhile, but this wears away.

RECAPITULATION.

In those cases of gingival irritation from whatever cause in which there is bone absorption and the formation of pyorrhea or pus pockets or food pockets,

First: Give the mouth a superficial cleansing.

Second: Inject a novocain solution in the gums of one affected side.

Third: Incise all loose gum down to the bone, eliminating the pockets.

Fourth: Curet all diseased tissue between and around the teeth.

Fifth: Smooth all necrotic and semi-necrotic bone, and all sharp bony septa and ragged alveoli.

Sixth: Flush out the mouth with a normal saline, chloramin, or iodine solution.

Seventh: Paint the wounded gum surface with a 5 per cent. to 10 per cent. iodine solution.

Eighth: Give the patient two to three grains of calomel or cascara, followed by a saline cathartic in the morning.

Ninth: Instruct the patient to gently brush the gums and teeth after the second or third day, with a preparation of one part alcohol, one part vinegar, and eight parts water.

Tenth: On the third or fourth day, scale and polish the teeth.

Eleventh: Paint these gums every other day with iodine.

Twelfth: After the gums heal up and pink, the patient should keep up the treatment of the gums with a stiff brush, brushing the gums over the teeth.

SECOND: INFECTED AREAS.

The second part of this paper has to do with infected teeth and infected areas.

These infections may be divided into three classes: (1) Exposed and infected

pulps. (2) Chronic apical infections.
(3) Acute apical infections.

Those who have used the X-ray extensively, not spasmodically, and have had the courage to accept and act on its findings, have found that a large percentage—as high as 95 per cent.—of the teeth whose pulps have been devitalized and the attempt made to fill the canals have incomplete or no root-canal fillings; 75 to 80 per cent. of these teeth have apical abscesses or apical infections radiographically discernible.

Of the 5 per cent. of those teeth whose root-canal fillings do reach the apex, a large percentage will yield bacterial cultures.

Of the 15 to 25 per cent. of the teeth which do not radiographically show bone destruction at the apex, there are a number about the roots of which, owing to super-imposition of bone densities one upon the other, the radiograph will not reveal bone destruction, although the destruction may be there. Furthermore, of this 15 to 25 per cent. which do not show bone destruction, there are a large number—if not the entire number as I have come to believe, and this belief is supported by the published evidence of a number of men and extensive clinical observations—which are infected and which contribute their quota of systemic infections.

I am convinced and firmly believe that less than 1 per cent. of all teeth upon which root-canal work has been attempted are safe teeth—teeth which are a benefit and not a menace.

(1) If these statements are true—and the evidence certainly is convincing to me that they are—it is dangerous to remove the pulps of teeth in the army dental service. As the difficulty of filling multi-rooted teeth is much greater than single-rooted teeth as a rule, I am firmly convinced that the attempt should not be made to fill teeth whose pulps have become exposed, either accidentally or from decay, or to fill those teeth whose pulps have been devitalized by pathological process.

(2) Further, in addition to the foregoing reasons, it seems a dangerous prac-

tice in army dental service to devitalize teeth with arsenic, which may be sealed in for an indefinite period, owing to the impossibility of the men receiving dental attention at the proper time, with the result that absorption of the arsenic may, by the time a man receives dental attention, have destroyed the pericemental membrane as well as the bone at the apex to a greater or less extent, necessitating the extraction of the tooth.

(3) The difficulty of maintaining aseptic conditions in order to fill simple and easily filled root-canals in army dental service is so great that it may be said to be prohibitive.

(4) The time taken to properly fill root-canals is so great that were it possible to do so, many absolutely safe and savable teeth would be neglected for the sake of one tooth, which, when filled under the best conditions, is an uncertain quantity. Therefore, it is perhaps in most cases, if not always, a dangerous proceeding. I consider it the safe, conservative practice to remove all such teeth.

With regard to abscessed teeth, either chronic or acute, there remains no doubt in my mind that all such teeth should be removed, for experience and the radiograph have firmly convinced me that few, if any, of such teeth are ever permanently cured by medicinal means. When they are apparently cured, they still remain a latent source of danger, because the apex has become infected and denuded, leaving a space about the apex which is liable to infection and about which the bone does not regenerate. The almost inevitable consequence of this is that a granuloma is formed, which slowly or rapidly enlarges, producing absorption of the bone and continuing to be a focus for systemic infection.

I have apparently painted an almost hopeless situation, and in many cases the situation is as hopeless as I have painted it, but we have an alternative in a simple operation of root resection which I shall describe later.

When it comes to broken-down roots and badly infected teeth, the only course open to us is to extract them and then

remove with curets the granuloma and all the diseased bone. Second, in most cases all that is necessary is to remove the granuloma, paint the cavity with iodine, and pack with iodoform gauze for three or four or more sittings. But there are a number of times when it is necessary to remove the outer plate of alveolar bone, cut away the gum, and make a shallow cavity; it is also unquestionably the better surgical practice to pack these cases until granulation tissue has begun to form. In my personal experience covering thousands of extractions both in civil and military practice, I have never regretted packing a socket or wound after extraction, but I have very frequently regretted not having done so.

ROOT RESECTION.

Root resection is the removal of a section of a root; root amputation is the removal of the whole or larger part of a root. These terms are neither arbitrary nor absolute, but quite accurately differentiate the two operations.

From anatomical considerations and accessibility, the upper and lower incisors are the teeth upon whose roots resection may be performed with least difficulty. They are, therefore, the ones recommended to be selected for root resection by those who are just taking up this work.

Resection of the upper and lower canines is a little more difficult; the upper second bicuspid and lower bicuspid are next in order, with due regard and care for the maxillary sinus and mental foramen, while the upper first bicuspid, the upper first molars, the lower first and second molars, and the upper second molars range in difficulty in the order named. Then follow the upper and lower third molars, whose roots may be resected only under the most favorable conditions, and are therefore not suggested for this operation.

It is well to make and study cross sections of the jaws of a dried skull in the region of all these teeth. By this means a good idea of the anatomy may be gained, as well as a knowledge of the

thickness of the bone about the teeth upon which this operation is performed.

First fill the root-canals as far as possible with gutta-percha, and then procure a good radiograph to show the following conditions: How far the root-canals have been filled; the extent of the infection, and the size of the granuloma or cyst; or, to indicate the location of the perforation, also the relation of the root or roots to be resected to the other teeth and to any other important anatomic structure.

Conduction or infiltration anesthesia with novocain and suprarenin is pre-eminently the anesthesia for this operation. Governed by local conditions, in the upper anterior teeth, centrals, and laterals, infiltration anesthesia or the infra-orbital injection in conjunction with an incisal injection may be used; on the upper canines and bicuspid, infiltration or the infra-orbital injection, or locally on the palatal side of each root, and sometimes a tuberosity injection in conjunction with these, should be used. For the lower incisors, infiltration or a mental injection on both sides, or a mandibular injection on one side and mental on the other, should be employed.

Nervous patients may be given two bromural tablets from twenty minutes to half an hour before the injection.

TECHNIQUE OF ROOT RESECTION.

Having sprayed the patient's mouth with a good antiseptic or normal salt solution, sterile gauze is packed under the lips; for example, in the case of an upper first bicuspid, as far back as the molars to prevent any saliva from entering the wound. After the anesthetic has been given and the usual tests have been applied to determine whether or not it is having the desired effect upon the jaw, with the jaws closed the site of the proposed incision on the gum is painted with iodine. With a sharp knife a crescent-shaped incision is made just below the level at which the root is to be resected, the center of the incision being in the median line of the tooth. This incision should usually be about three-

quarters of an inch in length. A periosteal elevator is then used to separate the periosteum from the bone toward the apex of the tooth for about three-eighths to one-half of an inch. A four or six-pronged retractor is inserted well into the flap held firmly up out of the way. Sterile gauze may be packed into the wound to clear away the blood and control the slight hemorrhage.

The outline of the root can now be seen. Chisels or gouges and mallet may be used to remove the outer covering of bone and uncover the root. This should be accomplished without going farther than is necessary and destroying the landmarks. After the root is uncovered, if nature has not accomplished this by pathologic process, a space should be chiseled around and above the apex. The greater the pathologic destruction the easier will be this step of the operation. Sufficient space must be obtained so that when the buccal root is resected there will remain room in which to see, work, and remove the palatal root. Remember that we are working on a first bicuspid.

Having cleared this space, the chisel is placed, bevel toward the apex, on a level with the plane at which the root is to be resected; with one or two sharp blows this apical section is severed, and may be removed with any suitable instrument; then the cavity is curetted and all pathologic tissue removed. It may require a little more chiseling to secure access to the palatal root, and to obtain room in which to see it and free it from any obstructing bone. Then, with the chisel at the desired level, two or three sharp blows of the mallet are given, and the palatal root is resected. This is removed and its cavity curetted of any pathologic tissue. The whole field of the operation should be syringed with normal salt solution, and then dried as well as possible for inspection. The sharp edges of the root-ends may be smoothed off with a surgical bur, and the original opening of the bone made smoother with chisels and curets. The wound is again syringed with normal salt solution, and dried with sterile gauze for inspection.

AFTER-TREATMENT.

There are two methods of treating such wounds. They may be either packed with gauze or sutured. This will depend largely on the condition of the wound and the extent of the infection, and sometimes the location. If it is decided to pack the wound, it is painted with a solution of iodine; novocain powder or orthoform powder, or a mixture of the two, may be put in the wound to allay any post-operative pain, and upon this should be tightly packed iodoform gauze. The first packing should be tight, as there is liable to be some hemorrhage when the effect of the suprarenin has worn off. Tight packing will also check the slight hemorrhage that accompanies work of this kind.

The patient should be given four to six trigenin capsules, two to be taken every two hours if there should be severe pain. The patient is instructed to apply a cold compress for fifteen minutes during each hour, to reduce or prevent swelling. The patient should also be instructed not to eat any meat for a day or two, and to take a saline cathartic the following morning. He should return in a day or two to have the packing renewed. The packing is then removed, and the wound irrigated with normal salt solution, painted with iodine, and then packed with iodoform gauze. The procedure is repeated every two or three days, using a shorter piece of gauze each time until the wound is healed, which will be in about three or four weeks.

The operation may be performed by the oral surgeon, and the after-treatment of the case carried out by the dentist's referring the patient to him.

If it is decided to suture the wound, it is irrigated with normal salt solution and dried with sterile gauze, painted with iodine, and then freshened with a curet in order to get a good blood-clot. Then the crescent-shaped flap is caught with rat-tooth pliers, and the edges of the wound are brought together in about three interrupted stitches with a circular needle carrying either silk or horsehair.

Care should be taken that the needle includes sufficient tissue on both sides of the wound, so that the sutures will not pull out. The stitches may be removed in about four days.

Care must be taken that the roots on each side of the one operated upon are not injured, nor the pulps of these adjacent teeth devitalized. All instruments, gauze, and dressings must be absolutely sterile.

The instruments used in this operation are those designed for this work, or suitable instruments may be selected from among those known as mastoid instruments.

CONCLUSIONS.

I regret that I have not the slides and radiographs with which to show clearly many of the points touched upon in this paper. There are also a number of points left out which I hope the discussion will bring out.

While this subject is most important from a military point of view, I am quite conscious of the fact that it is of equal importance from the point of view of civil practice.

American dentistry has had part of its foundation built upon the ability of American dentists to save and conserve teeth, but the accumulating evidence of the last five or six years clearly shows that part of the foundation to be built upon pathological quicksand, and, as clinical evidence and the X-ray clearly demonstrate, most of the work done upon devitalized teeth is a menace instead of a benefit.

Focal infections from the ends of the roots of such teeth are among the most certain, frequent, and insidious underminers of health that we know, and for the following reasons:

(1) These infections may, and most frequently do, occur without giving rise to any local pain or discomfort.

(2) Foci exist about the roots of teeth which have been supposedly well filled.

(3) Systemic effects are produced so gradually that the person thus afflicted is not conscious of any departure of his health from the normal.

(4) The presence of such foci of infection is usually not revealed except by either accidental or intentional diagnosis with the X-ray.

(5) Often these infections exist about the roots of septic teeth without giving any radiographic evidence of their presence or manifesting any local symptoms.

(6) The effects of these local infections are produced so remotely, both in time and in place, from their origin that there is no apparent connection between the two.

(7) There is hardly a person over twenty-five years of age, who has had dental treatment in which the pulp has been involved, who has not one or more of these apical infections. The older the patient, and the more dental attention received in the form of crowns, bridge work, and the removal of devitalized pulps, the more foci of infection he may have.

(8) These infections are the ones most puzzling to the oral surgeon and diagnostician, and the ones requiring his most skilful efforts to eradicate.

INFLUENCE OF THE TEETH IN SYSTEMIC CONDITIONS.

A few years or more ago physicians gave little or no attention to the influence of the teeth on their patients' health. Dentists up to within a few years looked upon teeth simply as part of the human machine, to be repaired, regulated, removed, or replaced, as the case might be, but with little or no regard to their relation to the rest of the human organism.

Within a few years a new conception of the importance of the teeth has arisen in the minds of both physicians and dentists, so that now some physicians when they cannot find, or before they have found, the cause of certain systemic and organic disturbances, look upon the teeth as THE cause, and the dentist as THE instrument in removing the cause of these diseases. Yet there are other physicians who do not consider the teeth as having any material effect on the cause or course of systemic disease. There is

still another class of physicians who look upon the teeth as one of the most important factors, direct and indirect, in the cause of certain systemic and organic diseases. They further believe that in consultation and co-operation with the dentist, and the employment of the X-ray, the local dental cause, if any, may be discovered and eliminated. These I believe to be taking a reasonable and just view of the situation.

Still other physicians and dentists are expressing the fear that the pendulum is swinging too far in the direction of indicting the teeth as the cause of systemic disturbances. They say dentists and physicians are claiming that all diseases and all infections may be traced to the teeth. This seems to be a very extreme view of the matter. Most of us have no such fear. The only fear I have is that not enough attention will be given to the teeth—that the importance of the teeth may be lost sight of, and that they may not be placed in such condition that they will help to fortify the body and build up the forces of resistance to disease.

A report on the pathogenicity of mouth streptococci in the May issue of the *Journal of the National Dental Association*, 1917, states:

We have noted several cases where mouth streptococci from dental abscesses have invaded the lymph glands of the neck, and produced a chronic non-suppurative lymphadenitis with cellulitis in one case, and two cases where strains of high virulence invaded the blood stream and produced death from septicemia; but aside from these non-specific types of infection, which may at times be produced by any organism, we do not believe that mouth streptococci have been proved to cause any other systemic disease than the various lesions that go to make up the disease known as rheumatism.

What is more important, it seems to me, than the failure to find these micro-organisms in other localities than those stated, is the larger fact that it is the diffusible, undetectable toxins produced by these micro-organisms and other micro-organisms that cause greater, more in-

sidious, and more widely distributed systemic and organic disturbances.

Let me call attention to that celebrated bacteriologist in London who had appendicitis and an infected tooth root at the same time. He refused to be operated upon until the infected root was removed. Then an examination disclosed the same micro-organism in the appendix that was about the tooth root. He also had colitis. A vaccine was made from the culture taken from the end of the tooth root and the appendix, and this cured his colitis. He also had nasal catarrh, and this was cured by the same treatment.

It seems to me that it should matter little to us whether or not the streptococcus viridans can be successfully isolated from or found in but one or two important organs, or in a dozen places. We have the opinions of distinguished pathologists supported by abundant evidence, that when the streptococcus viridans is found in the blood, it is a "four-alarm fire-signal, and all hands to the pumps." The why, how, or when they get into the blood from those apical abscesses is not so important right here as is the indisputable fact that they do get into the blood. And I should have said in parenthesis that the previously named organism is the one most constant in these chronic apical infections.

How many things are known to be true for which we cannot furnish the proof. The known provable things are very few. It is possible for me to read the history of case after case, both from my own practice and that of others, indicating the direct and positive connection between apical infections and systemic disease. This is neither interesting nor necessary, but I cannot help mentioning one or two in brief.

From a list of a number of cases cited by Dr. Epstein in the *Medical Record*, October 21, 1916, I select two:

A patient fifty-five years of age had an infected osteo-arthritis of the ankles and tarsus. This case was cured not by medicine, but by the extraction of several abscessed teeth. Another patient had a severe form of articular

rheumatism, and this case was cured not by drugs, but by the extraction of an abscessed cuspid.

Rheumatism is practically always a metastatic inflammation and arthritis which tends to recur as nature's warning of her effort to eliminate pus from some source.

Potter of Columbia University, in the *New York Medical Journal* of February 10, 1917, gives a list of thirty-one different diseases to which dental sepsis contributes. Some of these systemic and organic diseases may be accounted for by means of Billings' explanation, viz, that a chronic alveolar infection and chronic foci in other regions of the body may cause systemic disease by hematogenous bacterial emboli, which infect and at the same time deprive the tissues of nourishment. Local infections of muscles, joint tissues, and lessened blood supply result in the peculiar morbid conditions of the respective tissues. In 95 per cent. of the cases of herpes zoster, Dr. Lain of Oklahoma City found apical abscesses. In 85 per cent. of the cases of lichen planus, local infections were found. In

a majority of the cases the symptoms began to subside within a short time after the extraction of the infected teeth;—and yet, gentlemen, we are told that the pendulum is swinging so far that we should be conservative.

It appears to me that the responsibility which is being placed upon the dentist's shoulders, instead of being a burden to be side-stepped or shifted, will rather be a magnet that will lift dentistry to a higher level in the esteem, confidence, and honor of the community.

It has been said that I am too enthusiastic about the possibilities of dental service and of the future of dentistry, but let me remind those who do not share in this enthusiasm that without enthusiasm nothing great was ever accomplished. No one applauds more heartily or more earnestly than I the high standard of human service rendered by the medical profession—more so now that the day has arrived when the dentist may, if he will, render a similar service, and share with the medical man a like honor and distinction.

8 WEST 40TH ST., NEW YORK CITY.

Dental Broach in the Bronchus: Report of a Case.

By CHEVALIER JACKSON, M.D., and WM. H. SPENCER, M.D.,
Philadelphia, Pa.

THE dental broach (see Fig. 1) with its short shank and small-milled handle seems especially prone to slip from the fingers and disappear down the esophagus or trachea. This is the seventh case in our experience in which this particular instrument has been aspirated into the bronchi. Many have probably been swallowed and have passed through the gastro-intestinal tract without causing harm. The danger, however, that when swallowed the point of the

throat and mouth cavities for the double purpose of preventing infection of the root-canal and of rendering the entrance of foreign bodies into the gastro-intestinal and respiratory tracts impossible. The small size of this type of dental broach allows it often to reach the smaller divisions of the bronchi, from which it may be very difficult to remove. In most instances it has been found with the handle downward and the point upward so that there is great improbability of the instrument being coughed out, as the point tends to catch on the walls of the bronchi or would lodge in the narrow laryngeal orifice.

FIG. 1.



broach may perforate the intestinal wall, and also the evident tendency of this instrument to enter the lower respiratory tract, render the use of this type of dental broach more than commonly hazardous.

We are told that because of the liability to these accidents there is placed at the junction of the handle and shaft a small groove in which a thread or a piece of dental floss may be tied, so that the instrument may be freely rotated, yet if it should slip, it would be secured by the thread from being swallowed or aspirated. Eminent teachers of the dental profession, we are told, also advise the use of a rubber dam to wall off the

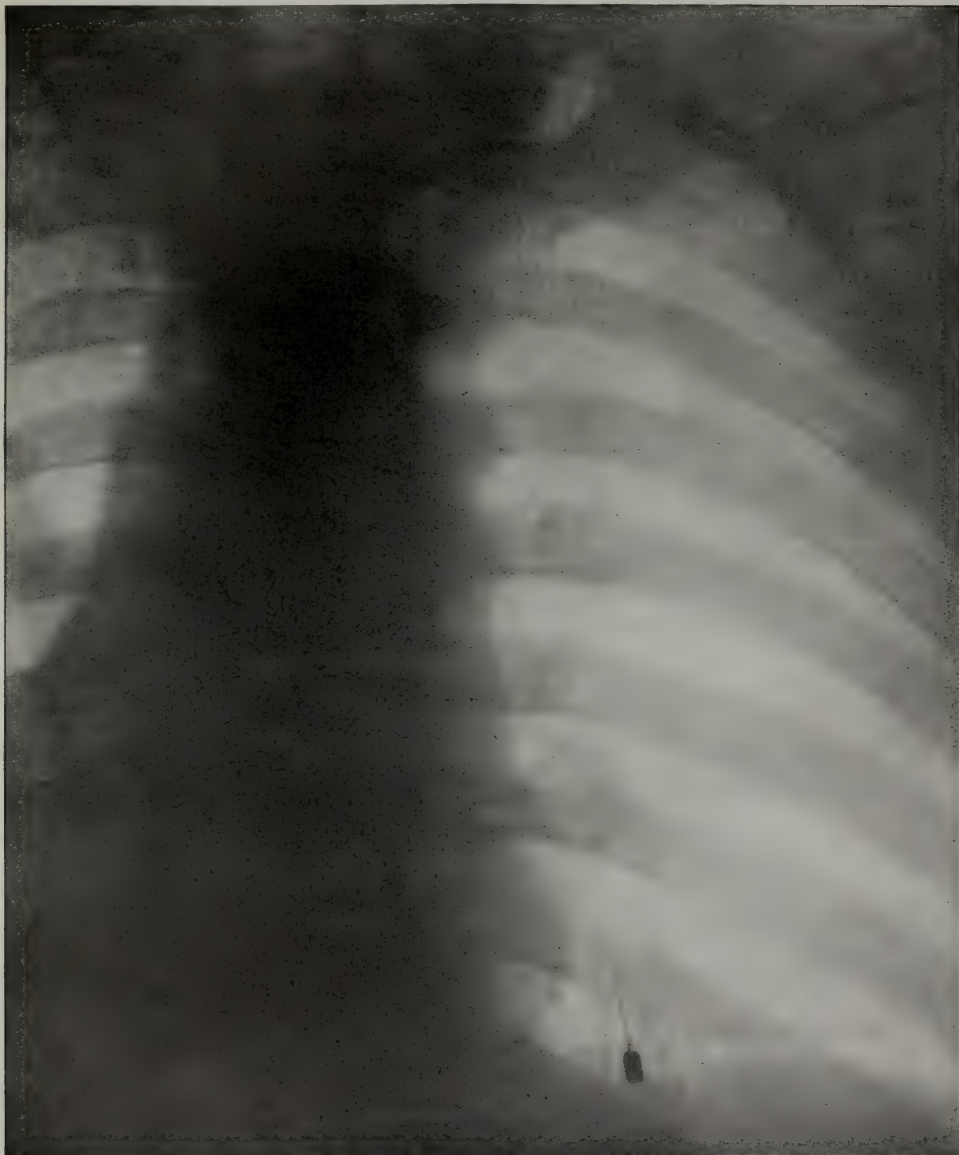
CASE REPORT.

The patient, Mr. A—, forty-five years of age, was referred by Drs. D. L. Despard and Thomas W. Tait with the history that eight days previously, while in the dentist's chair, he had aspirated a dental broach which had accidentally slipped from the fingers of the operator. The patient noticed for a few moments the sensation of a foreign body in the throat, but there occurred no coughing, no sense of dyspnea, and no dysphagia or odynphagia. It was assumed that the foreign body had been swallowed, and the patient was advised to eat hard bread and coarse foodstuffs. The stools were carefully watched, but the instrument was not recovered.

On the third day following the accident the patient complained of a tickling sensation in the substernal and laryngeal regions which caused a dry, hacking cough. On the seventh day there developed an aching sensation in the lower

chest which seemed relieved by lying prone. Dr. Tait was consulted, and im- previous to the entrance of the patient in Jefferson Hospital.

FIG. 2.



mediately advised a radiograph of the chest, which being made, showed the presence of the broach in the bronchus. No attempts at removal had been made

Condition on admission: Well-nourished, rather large adult, white, male. Lower respiratory tract examination showed—

Larynx. Cords somewhat reddened, with a small amount of adherent mucus attached. Motility normal. No induration. Moderate tracheitis.

Thorax. Rounded. Left shoulder lower than right. Walls thick with muscle and fat.

Lungs. Expansion free and equal. Percussion clear and resonant throughout. Breath sounds slightly harsher in the back from the angle of the left scapula downward, and also in the left axilla. Expiration not prolonged. Breath sounds distant over the lower right back. No râles or friction. Vocal resonance and fremitus seem normal.

Radiographic report by Dr. David R. Bowen before bronchoscopy:

There is a dental broach in the right lung at the level of the tenth interspace, approximately two inches away from the spine, and laterally in the plane of the posterior portion of the vertebral bodies. I am unable to localize it with reference to the descending bronchus. The handle is downward, the needle pointing upward, forward, and slightly inward. The antero-posterior diameter is fairly correct. The lateral diameter is correspondingly too high. (See Fig. 2.)

On the ninth day following the accident the foreign body was removed by peroral bronchoscopy, under local anesthesia, from a small branch of the lower right lobe bronchus, in ten minutes and one second. There was no reaction; the cough immediately ceased after the bronchoscopy, and the patient left for home feeling "perfectly well." Following the removal of the foreign body the breath sounds over the lower right lobe posteriorly became more distinct, and an occasional râle was heard.

Radiographs made after the bronchoscopy were reported as follows: "Examination after removal shows absence of the foreign body. There is no pathology."

COMMENT.

The slight disturbance at the time of the accident is very noteworthy, for it emphasizes the fact that the aspiration of foreign bodies is not necessarily attended by choking and dyspnea. We have in our records many cases in which the time of aspiration of the foreign body was not known, the cause of a chronic lung condition being found to be the presence of a foreign body only after radiographic study of the chest.

It is quite the popular opinion that a foreign body cannot be present in the bronchus without distressing symptoms. There is often a period of delusive calm in which even those symptoms incident to the trauma inflicted by the passage downward of the foreign body subside: this is followed, however, sooner or later by symptoms of obstructed bronchial drainage and by abscess formation in that portion of the lung. This patient had only a scratching in the throat at the time of the accident, and for three days had no symptoms whatever. The tickling sensation under the sternum and in the larynx, with the slight hacking cough, might easily have been overlooked until severe damage had been caused by the intruder, had the attending physicians and the dentist not been alert to the possible dangers.

The physical examination in this case revealed no definite evidence of pathology, and consequently was of no value in the localization. This case further exemplifies the importance of an early radiographic localization of a foreign body which has disappeared down the pharynx; so that if it be in the bronchus or esophagus it may be removed before it causes harm; and if in the lower alimentary tract, that its progress may be watched so that preparation may be made to remove it by laparotomy if perforation be threatened.

1830 SOUTH RITTENHOUSE SQ.

Considering the Wax Pattern.*

By C. S. VAN HORN, D.D.S., Bloomsburg, Pa.

(Read before the Academy of Stomatology of Philadelphia, December 19, 1918.)

CASTING by employing a disappearing model or pattern is centuries old. Art, craft, science, and literature have played their part in maintaining, co-ordinating, improving its status and broadening its field of usefulness; but at no time, until dental casting was amplified by Dr. Taggart, was precision in the metal replica of really grave importance, nor was the temperature at which the pattern was made or invested of any moment. In fact, at no time in the history of casting, prior to 1910, had any serious consideration been given to producing a casting of the same size as the wax pattern when at normal body temperature—the physical effect of heat upon the materials necessary to the process being either ignored or unrecognized.

Since wax, gold, and investing material expand and contract under varying thermal influence, and since dental inlay casting, when done under normal conditions, involves a series of both fixed and variable temperature conditions, it is clearly obvious that if cast gold inlay restorations are to be placed on a parity with our best malleted gold fillings—registering with the cavity margins at all points—we must depart from former casting practice and precedents, both ancient and recent.

In 1910, public attention was called to "A Technique which Makes Possible a Casting of the Same Size as the Wax Pattern at Body Temperature," in a

paper in the DENTAL COSMOS (August 1910, p. 873). This technique, which is known as the Expanded Pattern technique, not only takes cognizance of the physical effect of heat upon the materials used, but by utilizing its effect and controlling its action the investing process is placed upon a scientific basis.

In the present paper we shall consider only pattern-making and investing, but this need not necessarily exclude cavity formation and casting from the discussion.

PATTERN-MAKING.

Pattern-making is both an art and a science; art as to the carving, contouring, and polishing, and science with regard to the manner in which the wax is manipulated and treated to meet the cavity conditions at hand.

The only wax suitable for the purpose is the non-plastic variety. By non-plastic pattern wax is meant a wax that is not readily susceptible of bending, stretching, or distortion when at body temperature, but which will, if sufficient force be applied, break with a clean fracture. Upon the manner in which such wax is manipulated and treated to meet the cavity conditions at hand, depends very largely the therapeutic value of the cast gold inlay.

Each cavity requires intelligent consideration, but to avoid needless verbiage and useless repetition, we shall divide all

* [A full list of articles by the author on the casting process with special reference to the Expanded Pattern technique, may be found in the following issues of the DENTAL COSMOS—those of especial interest being designated by an asterisk: May 1909, p. 546; August 1910, p. 873*; June 1911, p. 664; October 1911, p. 1109*; August 1912, p. 890; September 1912, p. 973*.—Ed.]

cavities into three classes, viz, simple, compound, and complicated—a “simple” cavity being represented by a symmetrical hole in the buccal or occlusal surface of a tooth; a “compound” one by an approximo-occlusal cavity that extends to or just beneath the free margin of the gum tissue; and a “complicated” one by any cavity presenting unusual difficulties.

STATE OF WORKING PLASTICITY.

The temperature at which non-plastic pattern wax should be worked, or the state of plasticity to which it should be brought in order to meet the conditions at hand, cannot be definitely stated nor accurately described, as three important conditions enter into the proposition—(1) the condition to be met, (2) how it is met, and (3) the personal equation. Each cavity should be very carefully studied and methods established to circumvent any and all conditions which are unfavorable to a perfect adaptation of the wax to all margins, or which do not favor a condensation of the wax in the cavity.

Wax forms which simulate in shape the finished pattern, the wax-tray method, the liquid wax process, and matrices, of various types, are, either alone or in combination, very essential to successful pattern-making. Stuffing a cavity full of wax—no matter how carefully the subsequent operations be performed—usually spells failure in the fit of the inlay. It should be kept constantly in mind that correct pattern-making demands—(a) Perfect adaptation of the wax to all cavity margins; (b) Condensation of the wax in the cavity without stretching the wax; (c) A pattern carved, contoured, and polished as perfectly as possible, and (d) Removal from the cavity without the slightest distortion or marring of the margins.

Let us consider briefly how this may be accomplished in the three classes of cavities.

Class I. Simple cavities require but little care. A piece of wax a trifle smaller

than the orifice of the cavity and of sufficient length to give ample surplus is brought to the proper state of plasticity, placed in the moist cavity, carefully but firmly pressed home, and the pressure increased until the wax hardens.

Class II. Compound cavities require more care. An L-shaped wax form whose approximal extension, or leg, is a trifle longer than the depth of the cavity, is softened, pressed gently to place, and while the occluding teeth are brought gently into contact with the occlusal portion of the wax, a stiff, thin steel instrument is forced through the interproximal space, and as the patient increases the occlusal force the wax is pressed cavity-wise and downward against the cervical seat.

Class III. Complicated cavities require most care, at times ingenuity, to circumvent involved difficulties. And since this class of cavities comprises a very large and the most important part of inlay work, as such and as bridge attachments, and since failures more frequently occur in this field, we shall consider more in detail certain procedure looking toward ultimate simplicity in pattern manipulation and perfection in casting results.

Conscientious intelligence never has nor ever will assume that an inlay presenting a broad line of unprotected disintegrable material is dependable as a therapeutic agent. Neither does the consensus of intelligence born of experience permit the assumption that cast gold inlays, made for complicated cases, ever reach their marginal destination unless the pattern be properly and perfectly adapted.

We shall first consider an approximo-occlusal cavity extending so far beneath the free margin of the gum tissue that it is exceedingly difficult if not impossible by ordinary methods to force the wax into contact with the cervical margin. Make an L-shaped wax form which will give ample surplus; soften it, press it into the cavity, occlude the teeth, and mold it to the cavity margins to give ample surplus in overlap; trim off *only* the rough surplus. Note that no

special attention or consideration has been given to avoid stretching the wax or to condense it in the cavity. This very crude pattern is removed from the cavity, washed *clean* in running water or by spraying, and dried with cold air. We now have a more or less perfect *impression* of the cavity and the immediate surrounding tooth tissue. This wax mass has been designated the wax tray, and the procedure is known as the wax-tray method, or liquid wax process.

The clean, dry wax tray is attached to the wax-carrier, placed in the wax-softener (see DENTAL COSMOS, 1912, pp. 981, 982), and the temperature raised to the desired degree. The wax tray is now removed from the wax-softener and the entire cavity surface coated with liquid (melted) wax by painting it on with a No. 2 badger-hair (porcelain) brush, the painting being done as indicated by the perfectness of the markings left by the cavity in the wax tray. To illustrate: Assuming that our wax tray does not show a demarcation of the cervical margin of the cavity, but is apparently perfect in other details, we know that a greater bulk of wax is needed at that point than at any other; so the wax tray is coated accordingly. Just as soon as the wax tray is properly coated it is carried to the cavity, carefully but firmly pressed home, held under pressure until the wax hardens, and then carved and polished, the wax tray with its wax coating being thus converted into a finished wax pattern.

Another type of cavity in the "complicated" class is one in the occlusal surface of a molar and involving the sulci bucco-lingually to quite an extent, and the making of a pattern for such cases by the ordinary method invariably means stretching of the wax. A wax cone of adequate size is softened, pressed into the cavity, the teeth occluded, the rough surplus cut away, and the resultant wax tray treated as formerly.

The big bugbear to most inlay operators is the M. O. D. cavity, yet, while it is tedious, it is not at all difficult to manage if proper methods be employed. It will depend somewhat upon the oper-

ator and largely upon the case as to how this type of cavity is best manipulated. One method is to select two wax forms in precisely the same manner as though dealing with a single instead of a double compound cavity, and then fuse these two forms together at the occlusal extensions. This U- or staple-shaped wax form is then softened, carefully forced into the cavity, carved, and polished. This method, however, applies only to those cases in which there is no question as to the wax reaching its destination. In those cases in which doubt exists, the wax-tray method should be employed in precisely the same manner as previously described, it being by far the most simple and accurate.

MATRICES.

Many cases present, both in single and double compound cavities, necessitating the restoration of one or more cusps, and it not infrequently happens that an approximating tooth is missing. In nearly all such cases it is next to impossible to make a perfect pattern without employing an auxiliary matrix to confine the wax and prevent it from "mushing" out when the teeth are brought into normal occlusion. Irrespective of what form of matrix be used, it should be adjusted loosely enough to permit an ample surplus of wax at the margins for final finishing *after the matrix is removed*.

In making patterns for approximo-occlusal cavities where the approximated tooth is to be crowned, a failure can easily be averted by first constructing the crown, and, after placing—*not cementing*—the crown in position on the root, proceeding with the pattern-making.

Another of the same type of conditions is where we have approximating cavities facing each other, as a mesial cavity in a first molar and a distal cavity in a second bicuspid. Attempting to make patterns for both cavities by stuffing them full of wax and subsequently separating them by sawing or other means, usually spells failure. A more rational method consists in first filling one of the cavities with temporary stopping, and

then proceeding with the pattern-making; thus, in effect, forming the fourth wall to the cavity, as is the case with the crown. It is, of course, to be clearly understood that the cases now under consideration are of the type in which an auxiliary matrix is not indicated; these cavities could be easily manipulated if the missing tooth structure designated were present. We simply supply, so to speak, the missing tooth structure, with the advantage that, in the case either of the crown or the temporary stopping, it can be removed, if desirable, prior to finishing the approximal portion of the pattern.

CARVING THE PATTERN.

In carving it is of the utmost importance that the pattern remain stationary in the cavity, *i.e.* without moving and rubbing against the cavity margins. The best way to prevent this is to carve the occlusal surface before disturbing the contact of the pattern with the adjacent tooth. The support given to the pattern by the adjacent tooth, together with properly directed force in carving, enables us to make the most extensive restorations with seldom an appreciable movement of the pattern. After the occlusal surface has been carved, our attention is directed to the lingual margins, then to the buccal margins, and lastly to the cervical margins—all these margins being finished flush with the square tooth margins.

We now have a pattern—not an impression—carved to form, except that it has a contact surface—not point—with the adjacent tooth, and is unpolished. The polishing should be done in the same order as the carving: First the occlusal surface is gone over, touched where necessary with the carving instruments to bring out any artistic lines, and highly polished; then the lingual and buccal margins. Then with a pellet of moist cotton held against the occlusal surface to prevent any movement of the pattern, a hot, very thin flat instrument is passed between the adjacent tooth and the pattern, and the abnormally large contact surface converted into a normal contact point, and polished with a wisp of cotton, the teeth having been previ-

ously separated to admit of a normal contact being formed.

To remove the pattern an explorer is usually employed, though any of the well-known methods may be used, being especially careful to prevent the slightest marginal distortion. The pattern is then attached to the sprue and examined under a magnifying glass to ascertain its perfectness, and if it is found to be flawless in its marginal impressions, the final operation prior to investing is performed, namely: The entire cavity surface of the pattern, to within a couple of millimeters of the margins, is reduced by carving or scraping to make room for the cement under the cavity surface of the inlay.

Before passing to the investing process, permit me to emphasize the importance of the liquid wax process, as a valuable means to a desirable end, as a universal practice in all inlay pattern-making.

Careful observation leads to the conclusion that forcing a mass of softened wax into contact with all cavity margins and *holding it there until it hardens* is a very difficult matter. It is not at all unlikely that the majority of patterns, made in the ordinary way, even by careful operators and for relatively simple cavities, would show a discrepancy in marginal adaptation if accurate measurements were possible. In other words, the wax pattern made in the ordinary way is usually *smaller* than the tooth cavity—even though it shows the finest marginal and other cavity markings. This assumption is based upon the following observations:

In checking up the Expanded Pattern technique it was necessary to make patterns in technic teeth *under mouth conditions*, this being accomplished by employing a water-bath. While making wax patterns in technic teeth in a water-bath at 98.6° F. is not an easy task, the real difficulty encountered being to get a pattern that represented faithfully the size of the cavity. The reason for the difficulty in adapting pattern wax to a tooth cavity (either in the mouth or in a water-bath) is this:

When introduced into the cavity, the wax is at a temperature of 130° to

140°F., which gradually falls to 98.6°F. Now if the wax is at a temperature of, let us say, 120°F. when it is *finally* adapted to the cavity, there will be a discrepancy in the size of the pattern and the size of the cavity, represented by the shrinkage in the wax when passing from 120° to 98.6°F. Every known method was tried to overcome this discrepancy, but none seems so simple and certain as the liquid wax process when utilized intelligently. And it is recommended to the exclusion of all other methods for the *final adaptation of ALL inlay patterns*—the reason being as now to be described.

Reviewing very briefly the wax tray method: After the cutting away of the rough surplus, the crude pattern is removed from the cavity, washed, and dried with cold air. Observe that the wax mass is now at room temperature, or possibly a few degrees below. It is now thinly coated with liquid (melted) wax, returned to the cavity, and gently but firmly forced home and held under pressure until the wax mass assumes mouth temperature. Please note that we have introduced into the cavity a wax mass which is, as a mass, *below* the normal body temperature; therefore, as this wax mass (which has been previously fitted to the cavity and then thinly coated with wax) assumes mouth temperature, the tendency is to *expand* (rather than contract), thus correcting the discrepancy previously mentioned. Further comment seems unnecessary, save perhaps to point out that the assumption, by some writers, that the temperature of the field of operation in gold inlay work—or as it has been stated, “open-mouth temperature is essentially room temperature” (I am quoting from memory)—is erroneous. Early in our experiments, consideration was given to the field of operation in gold inlay work (molar and bicuspid region), and it was found to be essentially body temperature.

INVESTING THE WAX PATTERN.

The Expanded Pattern technique, previously referred to, is based upon the

physical effect of heat upon the materials necessary to the casting process, viz, wax, investing material, and gold; each having its individual co-efficient of expansion and contraction under varying thermal influence, the wax being especially susceptible.

Since pattern wax is very susceptible to the physical effect of heat—a rise or fall of a few degrees meaning a corresponding change in the size of the mass—it is at once apparent that no process, no materials, and no device has yet been evolved which would produce two gold castings of the same size for the same cavity *unless those patterns were invested at the same temperature*. And since gold shrinks when passing from a fluid to a solid state, we have the further concrete proposition, viz: To insure a casting that will register with the cavity margins at all points, it is necessary that the wax pattern be invested at a temperature sufficiently above body temperature to compensate for the shrinkage in the gold, which is in excess of any change in the mold at the time the cast is made. This *most naturally* implies that it makes little difference whether the casting be done in a hot or in a cold mold, *provided* the investing of the wax pattern is done under proper thermal conditions and the investing material and the wax possess the correct physical properties.

Investing a pattern according to the Expanded Pattern technique, demands: 1st, Thorough mixing of the investing material; 2d, Entirely coating the pattern with this investment without trapping any air-bubbles on the cavity surface of the pattern—especially at the margins; 3d, The setting of the investment shall not be too rapid; ample time must be given for the *invested* pattern to assume the desired temperature before the setting period begins, say ten minutes; 4th, The pattern must be invested at a given determinable temperature, which, in effect, must be constant throughout the investing process.

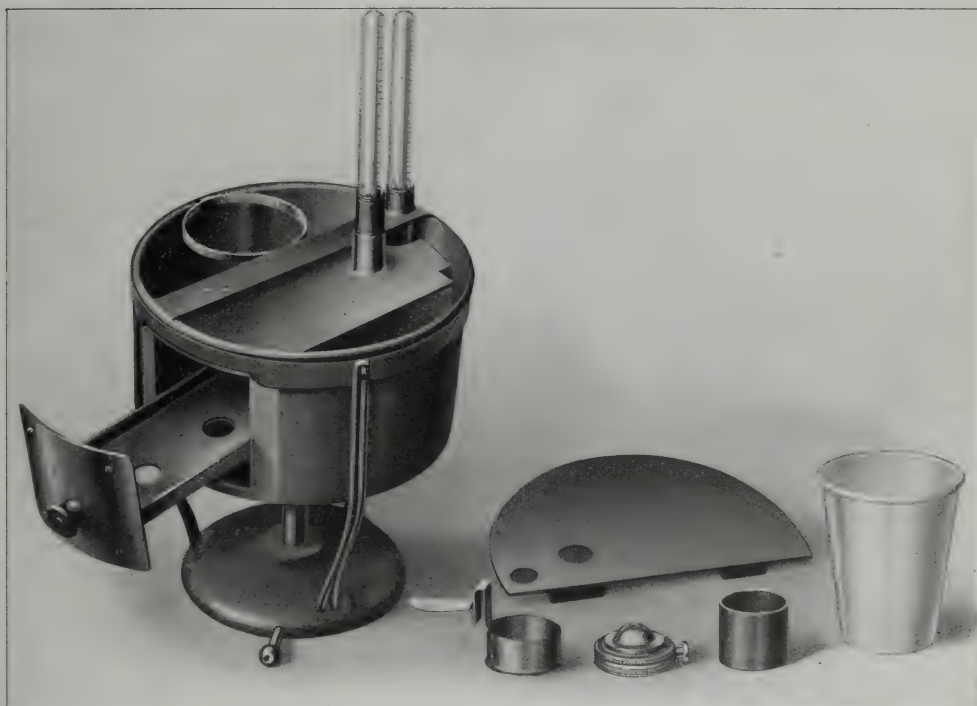
(1) Mixing is easily accomplished by dumping a given quantity of warm water into the mixing-cup on to the dry in-

vesting material, and thoroughly stirring with a thin spatula. It has not been shown that any mixing device—complicated, elaborate, or simple—has any merit over the spatula and cup method; and any device which does not provide a warm investment, or which retards the transfer of the mixed material to the

water. Painting the investment on usually produces air-bubbles and consequent nodules on the casting.

(3) Should the investing material be too rapid in setting, it may be retarded by adding borax water, *but an investment which possesses correct setting properties is much to be preferred.*

FIG. 1.



Universal Investing Standardizer.

pattern and into the flask, is not at all suitable for the purpose for which it was designed.

(2) Eliminating air-bubbles is easily accomplished in much the same way as when pouring a partial impression. The pattern is dipped in the warm water, the investment is "picked up" with a No. 2 badger-hair (porcelain) brush, placed upon a prominent smooth surface of the pattern, and by gently "shoving" with the brush, induced to flow *wedge-like* into the pockets, displacing the

(4) Investing at a given determinable temperature which, in effect, is constant throughout the investing process, requires a device which has been named the Investing Standardizer. (See Fig. 1.) So far as I have been able to ascertain, utilizing the physical effect of heat to expand a wax pattern to compensate for the shrinkage in a casting, is a new thing in art and science; therefore it would not be at all difficult to cover both the process and the device with letters patent, but that has not been done:

any individual is at liberty to utilize the process, and to make the device for his own use.

FUNCTION OF THE INVESTING STANDARDIZER.

The function of the "investing standardizer" is—1st, To provide a means of investing the wax pattern at a given, determinable temperature which will remain constant throughout the setting or hardening of the investment; and 2d, To expand the wax pattern by transmitting the required heat from the standardizer, *through the plastic investment*, to the wax pattern during the setting of the investment. Other conditions being equal, the degree of heat which is transmitted to the wax pattern *during the setting* of the investment, regulates the relative size of the casting to the wax pattern *when in the tooth cavity*. Hence, to produce a casting of the same size as the wax pattern when in the tooth cavity, the pattern must be invested at a temperature sufficiently above normal body temperature to compensate for the shrinkage in the gold which is in excess of any change in the mold at the time the cast is made.

The temperature at which the pattern must be invested to produce this result will depend quite largely upon whether the casting is to be made in a *red-hot* or in a relative *cold* mold, and to a lesser extent upon any physical property claimed for the investing material *per se*. An ideal investing material would be one which did not expand or contract when passing through the degrees of heat which are necessary to burn out the wax and fuse the gold in the crucible in the investment. In that event the mold would remain fixed as to its dimensions at the time the investment hardened. Since most investing materials show a slight expansion under heat, the pattern must be invested at a *higher* temperature when the casting is to be *done in a relatively cold mold*.

The flask with its invested wax pattern must remain in the investing standardizer, *at constant temperature*,

until the investment is thoroughly hard. And since the pattern is expanded by virtue of the heat in the *soft* investing material, it is readily apparent that the investment must not begin to set until such time as the pattern has assumed the desired temperature. Another point: The temperature of the investment in the flask will at no time be the same as that recorded by the thermometer in the water-bath, there being a difference of about 2°F. minus.

A UNIVERSAL INVESTING STANDARDIZER.

In the original investing standardizer (see DENTAL COSMOS, October 1911, pp. 1111-12) the flask was placed directly in the water-bath—consequently a special flask was required, and that, in turn, necessitated a special casting device, which, naturally, was an objection; this led to a re-designing of the investing standardizer, making it universal, *i.e.* admitting the use of any style of flask. The re-designed Standardizer (see Fig. 1) is constructed as follows:

A 30-gage (water-tight) copper box $2 \times 2\frac{1}{4} \times 4\frac{1}{2}$ inches is "let into" the spun copper pan through an opening cut in the side; the pan is 3 inches deep by $5\frac{1}{2}$ inches in diameter. The copper box, which forms the temperature chamber, is completely surrounded by water save at the front end. Into it is fitted a tray, or drawer, which slides on runways or fins projecting (inward) from the sides of the box; the front end of the tray forms the cover, or door, and is lined with $\frac{1}{8}$ -inch sheet asbestos between two copper plates; the tray is constructed entirely of 23-gage copper. A tube, which admits and supports the thermometer, is soldered in the top of the box at the rear end, and the box is soldered to the pan at the opening cut in the side. A piece of 23-gage copper is fitted to the top of the pan, covering about two-thirds of the opening, and forming a *warm* surface upon which to place the flask and crucible-former while investing the pattern. In all other characteristics, this new device is identical with the former standardizer.

TECHNIQUE OF INVESTING THE PATTERN.

Briefly stated, the technique is as follows: The wax pattern is attached to the sprue, the sprue fixed in the crucible-former, and, together with the flask, it is placed in the temperature chamber. When all is at the desired temperature, the flask and crucible-former are removed, placed on the copper surface, investment mixed, pattern coated, flask placed in position, filled with investment, and placed in the temperature chamber.

SPECIAL NOTICE.

In starting the investing standardizer from cold, it must be observed that—1st, After the thermometer in the *water-bath* reaches the desired temperature, it takes about ten minutes for the temperature chamber to assume its correspond-

ing temperature; 2d, After the invested pattern is *returned* to the temperature chamber (which, of course, is now at the desired temperature), it takes about ten minutes for the flask and investment to assume the same temperature as the chamber—there being a lowering in temperature of the flask and investment during the investing of the pattern; 3d, The temperature chamber *must remain closed* constantly, save, of course, during the very brief periods of transfers of the flask, etc.; 4th, For more detailed description of the investing process, and the principle of the investing standardizer, see DENTAL COSMOS, October 1911, p. 1109 — the new standardizer being identical in principle and essentially the same respecting its operation, except as noted.

[See also *Discussion*, as reported under "Proceedings of Societies," this issue.]

New Bridges for Old.

By DAVID F. BURKE, D.M.D., Manchester-by-the-Sea, Mass.

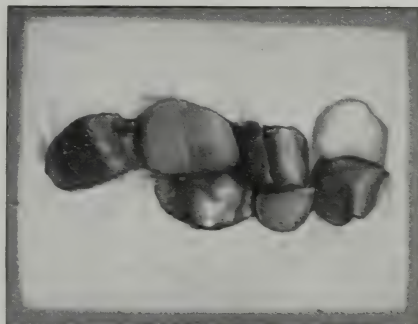
IN a paper published in the March 1918 issue of the DENTAL COSMOS, entitled "A Simple Form of Removable Bridge Work," etc., Dr. N. B. Nesbett presents a method of making removable bridge work which the writer has found to be very useful and satisfactory. The case presented herewith is the result of the writer's effort to apply these principles in practice.

To make this "simple form" of removable bridge work is not so simple as the name implies, even when the teeth to be clasped retain their original contour; but when the teeth have lost their contour, the difficulty in making clasps that will hold to the teeth increases in direct proportion to the extent of the mutilation of the enamel of the teeth.

Fig. 1 illustrates two bridges removed

from the mouth of a man who wanted them replaced with the cleanest appli-

FIG. 1.

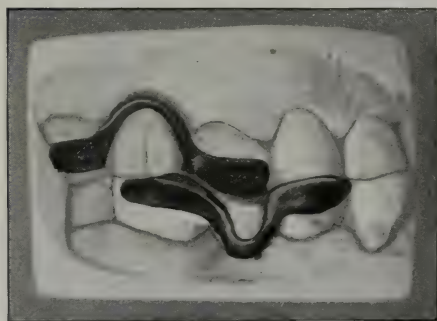


ances possible. A special trip was made to New York for the purpose of studying

the merits of some patented removable bridge appliances in active service, but we saw none that were not acting more or less as food traps. Even after teeth were mutilated to receive the female parts of these supposedly clean appliances they seemed worse germ-harborers than if they presented well-fitted shell crowns.

The writer decided to try the "simple form," which is obviously clean and can be kept so. The only objection we have to the method is the name, which is misleading, as many can testify who have attempted to apply it in practice.

FIG. 2.



Assuming that the reader is familiar with the technique of making pinlays, I will simply say that the occlusion of the mutilated teeth was restored with pinlays, using the tough S. S. W. 22-gage iridio-platinum wire bent in staple form. Careful technique must be used, or the pinlays will not stand the friction of the cast clasps to be used, without dislodgment.

Four "simple-form" appliances, two upper and two lower, were assembled, and they were so "movable-removable" that they slid off the abutments which had been ground to receive the shell crowns of the fixed bridge. It was decided to try cutting grooves in the abutments for the purpose of receiving the clasps. Upper and lower bridges were assembled, and they are giving satisfaction to date (see Fig. 2)—so much so that we heartily recommend the following method to anyone meeting the same problem.

On the lingual surface of the abutments, approximately 1 mm. from the free margin of the gum line, a groove 0.5 mm. deep by 1 mm. wide is cut, with a No. 5 carborundum wheel, in a line extending along the surface where it is intended that the wings of the clasp shall seat. On the buccal surface, cut the groove where the contour begins. A clean-cut groove must be made, and this can be done on sensitive teeth if procain is administered.

Fill an individual impression tray with a thick creamy mix of the best plaster of Paris, which has been thoroughly dried before adding the potassium sulfate and water, and take a perfect impression of each individual tooth to be clasped. This is easier than the method of attempting to get an impression of one side of the jaw in one operation.

Into this perfect impression of each individual tooth pack True Dentalloy around an ordinary iron picture-frame brad, which serves as a handle for the die to aid in manipulating it later. (We assume the reader is familiar with the proper technique of mixing alloy). Make a smooth mix and express the excess mercury through spunk.

When the die is ready, it is coated with castor-oil, and a wax form is shaped about the tooth and Standard black inlay wax added to form of clasp desired. Carve to outline desired and seal the wax to the die with a warm instrument. This wax combination can be further strengthened by the addition of a thin film of Kerr's sticky-wax, which will impregnate the black wax. Attach the sprue and place the model in a pan of cold water for five minutes, when the wax clasp can be sprung away from the grooved die without breaking the wax.

We further assume that the reader is proficient in the art of accurate casting and in making the middle section of bridge. In our hands the Ney "E" metal cast in clasp form is brittle and can be broken by pressure between the thumb and index finger, but S. S. W. clasp metal added to the Ney "E" metal removes the tendency to break and in-

creases the elasticity of the clasp, which will cling to the groove.

After the cast clasps have been adjusted to the dies they are tried on the teeth, and if satisfactory a plaster impression is taken with the clasps in place. A model of plaster, to which has been added a little Taggart investment, is run, and this combination will stand the heat of the soldering process when the middle section is assembled. The bite, of course, is taken in modeling composition by the accepted method before the plaster impression is made with the clasps and middle section in proper position.

It is obvious that soldering the clasps on the model made from an impression of the clasps in correct position on the abutments is safer than soldering the clasps to the middle section in an investment made from a plaster impression of

clasps on an amalgam die made from an impression of the teeth.

The success of the appliances described in the March Cosmos was due to the shrinkage of the "E" metal in casting, causing a firmer hold on the teeth. The success of the bridges described above was due to the shrinkage of a more elastic metal used in casting the clasps—these clasps being seated in a groove in a manner similar to the mechanical principle involved in the spring clasp which holds the S. S. W. handpiece to the elbow extending from the equipment stand.

The bridges were not marvels of esthetic dentistry, but they were perfectly satisfactory to the patient—who, by the way, is quite fastidious, and whose manner of living signifies that he is not easily satisfied.

1 SCHOOL ST.

Honesty and Harmony in the Dental Profession:

Some Suggestions for Obtaining Them.

By S. HERDER, D.D.S., Mount Vernon, N. Y.

ONE of the best attributes of a sincere friend, I believe, is that he will point out to you, at the right time and in a proper way, your faults and discrepancies, with the purpose in view of helping you to rectify them. The dental profession can gain a great deal more by having its members working together in friendly, helpful harmony than by having each individual member working in his own private direction with his own pet ideas, disregarding to a large extent a great many of the vital thoughts and important truths propounded by others.

If it were possible—and it certainly should be possible—to have in this country a dental commission, consisting of

men of the highest reputation, ability, and integrity in the dental field, whose duty it would be to carefully and scientifically examine every new and plausibly good dental thought that is brought forth, with a view to determining its merits, a great deal of dental progress would certainly result. The very conclusions of a commission as nearly an unprejudiced one as this should be would indeed receive a proportionately high regard and recognition by the dental profession. These conclusions would therefore supersede all others, which in their very nature are inherently partial and prejudiced.

As a logical sequence, all petty jealousy and ill-feeling between men gen-

erally considered of high repute in the dental profession, but who happen to differ materially in their dental ideas and methods, would be eliminated to a great extent. Unity and co-ordination between men of established dental ability would therefore mark a very happy milestone upon the road of dental progress. Another great advantage of such a commission would be the saving of the health and energy of both dentist and patient by the definite determination of the worthlessness of some new radical dental idea after its having been carefully considered by this commission and so found. Thus would the great mass of dentists be spared the great cost and annoyance that is the unfortunate accompaniment of discarding presumably good ideas which sad and bitter experience afterward proved to be decidedly poor ones.

Still another advantage of this commission would be that the great mass of practicing dentists would be furnished with a list—revised from time to time—of what had up to the time of its publication been determined as the proper methods and technique, in performing all of the various phases of dental work that fall to the lot of practicing dentists.

There is so much room for improvement in the dental profession of today that discussion of some of its errors and shortcomings seems well-nigh imperative. There are some dentists—let us hope not many—who seem to object to having the faults and drawbacks of the dental profession pointed out to them. When these persons begin to realize that the only way wrongs can be righted is by first having them clearly pointed out, they will very shortly cease to urge their illogical and apparently thoughtless objections.

Among the evils of the present dental conditions there is one fact particularly which must over and over again be definitely impressed upon the members of the dental profession until their opinion will become so strong as to permit it no longer to exist as a factor for evil. Without proper consideration of this fact no substantial progress can be made in the

dental profession. Those dental magazines that are disinclined to bring this fact emphatically to view are undeserving of the high regard of readers who have an abiding faith in them as exponents of truth and honest dental reasoning. The fact I refer to is the extremely poor quality of dental work that has been, and still is being continuously performed upon the mouths of a vast army of innocent patients by the average dental practitioners of today. The causes and logical remedies for this unfortunate condition of affairs ought to be clearly determined, and at the earliest moment possible. One of the chief causes for the aforesaid condition, to my mind, is insufficient and improper dental teaching and experience.

Another prominent yet seemingly innocent cause is the everlasting and undeniable economic element, which is not a mere bugaboo but indeed a most stern and unpleasant reality. The ever-present problem of the average dentist's apparent inability to earn more than a very bare livelihood is one that cries out in its pitiable seeming despair for earnest, fair, and prompt solution.

Although it is appreciated that proper knowledge is an absolute essential to the correct performance of dental work, yet it must not be forgotten that the dentist himself as a human machine must also receive the proper care that his standing in life calls for, if any kind of dental service at all can be justly expected of him.

My conclusion therefore—which seems inevitable—is that the first cause, that of insufficient and improper dental teaching and dental experience, has included and overlapped the second one, that of the apparent inability of the great majority of dentists to earn an honest livelihood. For it must be known in the last analysis that no dental fee can be considered as honestly earned if it represents improper dental service.

If, as seems to be the case today, it is impossible for dental colleges to provide graduating dentists with a comparatively thorough knowledge of the profession of dentistry, the least that can be done is

to see to it that that knowledge is obtained elsewhere before those dental graduates are permitted to practice for themselves in their own private offices. Therefore, for the protection of the innocent public and the self-respect of the dentists, I would suggest that the following thought be incorporated into law: That no dentist shall be permitted to practice dentistry for himself in his own private office, at least in the future, unless he has served an apprenticeship with a capable dentist, designated by a recognized dental body, for a length of time considered sufficient by the same body—such as, for example, the Board of Regents.

One of the seemingly small though really large matters that is very largely overlooked by dental colleges is the one aside from furnishing the actual dental knowledge, namely, how to properly handle the patient from the remunerative viewpoint, *i.e.* obtaining the proper dental fee.

It seems that both in justice to the patient and to himself, the dentist ought to have a comparatively good understanding of the business side of dentistry. He ought to know what his expenses are and what his services are worth; whether he should, for instance, charge a certain definite sum per hour plus the cost of materials, or make one lump sum charge for all of the dental work to be done in the mouth of any particular given patient. Incidentally, it appears that

the great majority of dentists have adopted the latter method.

In the interest of honest dentistry it seems to me that it would be far better if there were a general understanding between all of the members of the dental profession throughout the country to the effect that proper dental work cannot be performed upon patients unless it is first made possible for the dentists themselves to earn an honest livelihood; and that, in order to guarantee that livelihood and thus materially assist in protecting the health of dental patients, no dental work shall be performed upon patients' mouths for less than a certain stipulated minimum charge per hour, exclusive of materials and other expenses absolutely necessary to properly conduct any given dental office. For it must be definitely understood that even the average dentist must earn a livelihood commensurate with his particular station in life.

Having assured the dentist of his honest livelihood, we have forever removed at least one of the foremost reasons for the performance of improper dental work. Thus, finally, by both encouraging and making it economically possible for dentists to do proper dental work, we shall be taking the most effective step toward raising the dental profession to its proper scientific and respected status. It is for the realization of such ends that dental truth-seekers everywhere live and hope.

6 EAST FIRST ST.

Report of Several Cases of Grave Systemic Disturbance Doubtless Caused by Pathological Condi- tions of the Dental Organs.

By A. W. STRECKER, A.M., D.D.S., Philadelphia, Pa.

CASE I. Miss A. B., single, age fifty-five years; family history good. Patient's health good up to about a year before I saw her. The first symptom was pain in the entire region of the fifth nerve, followed later by twitching of the left eyelid. About nine months after the first attack the left eyelid was paralyzed. About three months after the eyelid became paralyzed I was called to see the patient at the hospital, and discovered a bridge in the upper jaw on the left side extending from the third molar to the first bicuspid. The bridge was in a filthy condition; abutments loose, and pus flowing freely. The facial condition was attributed to this, and an operation was performed. Four days after extraction and treatment the pain left her, and two days later the eyelid was restored to normal condition; a complete recovery occurred, the general health of the patient again becoming normal.

Case II. Miss A. H. D., single, age thirty-seven years. No family history of rheumatism. Severe case of arthritis deformans. Patient could not walk without assistance. The first symptoms of rheumatism were noticed about three years prior to this time. On questioning the patient it was found that she had had considerable dental work done about one year prior to the first symptoms appearing. The case did not respond to treatment for rheumatism, so was referred to me. Crowns were removed from both upper right bicuspids, the bicuspids and molars on the upper left

side and four lower incisors. All the root-canals were found to be filled with cotton. There was considerable pus, and very offensive odor. Treatment was instituted; two teeth were extracted, several bad roots amputated, and two canals were sterilized and filled. A gradual improvement was noticed. At the end of three months the patient was restored to health, and her walk was smooth, without any hesitancy.

Case III. Mrs. D. F., married, mother of three children; was pregnant at this time (seven-month period). Paralysis (slight) of the left side of the face, gradually spreading in area and becoming more pronounced. The physician referred the patient to me with the object of relieving the pain from the teeth. The lower second and third molars were badly decayed and abscessed. Extraction was advised. After the teeth were removed and the bone curetted until healthy tissue was reached, proper treatment was instituted. The patient became normal in health, paralysis disappeared, and at the proper time gave birth to a perfect child.

Case IV. Mrs. A. R., married; age thirty-two years. History good until four years prior to my seeing patient, when several slight attacks of twitching of the left side of the face were noticed at intervals of three to six months. The first of these attacks lasted for two days, gradually increased in severity and duration, and culminated finally in an attack of facial paralysis involving the entire left side of the face. The

case was treated as paralysis due to a nervous condition, the patient being under a severe mental strain due to business worries. The case having come under my notice, upon examination I found that the pulp had been removed from the upper left central incisor. An X-ray was taken which revealed the fact that the canal of the tooth was not filled, and an apical abscess was very prominent. Upon investigation it was found that the canal had been filled four years previously, but the tooth became painful and the root-fillings were removed and replaced with cotton; the patient was told it was all right, and the tooth was filled with cement. The tooth was extracted, treatment having failed. After a period of three weeks the paralysis gradually yielded to the high-frequency current, and now after six months the patient is perfectly normal—no pain, no discomfort, and no paralysis.

Case V. Mr. V. F., age thirty-two years. Two years prior to this time the patient had weighed 173 lb.; height 5 ft. 10 in. Family history excellent. The patient's history up to time of this condition had been excellent; now under treatment for tuberculosis. Three physicians at various times examined him. He had night-sweats, no appetite, loss of weight. Two years after first consulting a physician he was in a sanitarium for tuberculosis. I was called to see him for another condition. Making an examination of

his mouth, I discovered a large opening back of the lower right second molar. On probing, I discovered a piece of badly necrosed root, and that the bone was also badly necrosed. Patient now weighed 97 lb., and the physician in charge of the case would not allow an operation, claiming the patient was entirely too weak. He died in two weeks. The post-mortem showed that his lungs were in good condition, and that death was not due to tuberculosis.

Case VI. Sister R. A., about thirty-five years of age; teaching school. Suffered with severe headaches, so much so that her retirement from active duty was considered unavoidable. Her eyes were treated, and a complete physical examination revealed no organic trouble. After some time the case was sent to me, and I discovered a severe case of pyorrhea. Treatment was at once instituted, and after the fourth treatment the headache ceased. Before completion of the case, however, the patient was compelled to leave the city. Six months later her condition was as bad as ever. She returned to Philadelphia for treatment and remained for seven months. The headache and other symptoms completely disappeared, and after two years have not returned. Patient has gained in weight, has a good appetite, clear mind, and eagerness to do her work.

REAL ESTATE TRUST BUILDING.

Dentistry and the Public.

By HERMAN AUSUBEL, D.D.S., Brooklyn, N. Y.

THE reports of dental examiners in the public schools with regard to the condition of our children's teeth are most alarming. The findings of our draft boards as to the condition of the teeth of our soldiers, the defenders of world democracy, is most discouraging. This country, with all its enormous wealth and practical common sense, should never have allowed these conditions to exist.

The Preparedness League of American Dentists has been created to try to relieve this apparently hopeless condition as an emergency measure. Thousands of dentists have volunteered to treat the mouths of drafted soldiers gratis. Much good has thus been accomplished in preparing thousands of men for active service in the field who would otherwise have been incapacitated and would have been a hindrance to their fighting units. Credit is due to this organization, and to Dr. Beach who is at the head of it, for its splendid work.

But this is only a war emergency measure, and as soon as the war is over will likely cease to exist. Things will be allowed to go on as in the good old days. People will be allowed in their ignorance to take care of their own health and teeth. Children's teeth will be neglected as before. A medical examiner, who generally knows as much about dentistry as the average layman, will be permitted to examine children's teeth in the schools, and when he finds an extra-large cavity or an aching exposed pulp he will send a notice to the parents to take their child to the dentist. With this his responsibility ceases.

But what do the parents do when they receive such a notice? Most of them are

too poor, struggling for an earthly existence, to think of the luxury of taking their children to the dentist, and they do so only when the child is awake three or four nights in succession, suffering excruciating pain from an exposed pulp or developing abscess, and that after they have tried all the remedies from the drug-counter.

Many others who have money are ignorant and think it a waste of money to have their children's teeth filled, when "they will fall out anyway." I have considerable difficulty in convincing such mothers that "these big teeth in the back part of the mouth" are permanent teeth, and therefore need to be filled. They mistake the first molar for a temporary tooth because "The child never lost a tooth from this place." I know physicians and school teachers who do not know this as a permanent tooth, and how can you expect an ignorant mother to know it?

Decay is allowed to take its course in childhood, and when the individual grows up it is too late for us to do anything of service to him.

The first molars, the supporters of the jaws, the biggest and most important teeth in the mouth, this tooth being designated as the "key" to occlusion, are generally lost before we have an opportunity to see them. When the parents appeal to us for help it is too late.

If the pulps are exposed previous to the age of nine years we cannot devitalize them and fill the roots, as they are not perfectly calcified and completed. Most children would refuse to submit to such a tedious and painful process, even though we could fill them.

If the pulp is dead or the tooth ab-

scessed, it is worse. In both cases we have to extract these important teeth, which could have been easily saved with little pain to the patient, had we seen them in time.

With the extraction of these teeth the jaws lose their natural support, the entire occlusal balance is lost, the other teeth move apart, food lodges between them and causes caries. The upper anterior teeth, not being able to stand the entire pressure of the jaws, are pushed outward by the constant hammering of the lowers against them, disfiguring and incapacitating the patient for life.

If the tooth is fully developed and we do devitalize, how many root-canals do we fill properly? How much trouble has been produced by just this desperate effort of ours to save the child's teeth? Many of these teeth abscess and become foci of infection to undermine the child's health, producing endocarditis, arthritis, and other "itises" known to our research men.

When the child gets out of school and applies to us to remedy the disfigurement, what are we doing for it? We insert a "bridge," a cemented septic piece of jewelry for which Hunter so justly reprimanded us. The insertion of these bridges necessitates the mutilation of other natural teeth to be used as abutments for the reception of gold caps, inlays, split pins, etc., with probably more tooth devitalization. It is all a part of a "vicious circle," which in turn entails the devitalization of more teeth from excessive grinding, pressure, or cement irritation. Many gold caps wear through and inlays become dislodged or leaky without the patient's knowledge; more teeth decay, and more pulps become diseased, necessitating more devitalizations and extractions with butchering of the remaining teeth if we attempt to make restorations. When the patient is thirty, he has a mouth filled with gold junk, inflamed gums, and offensive odors that contaminate every particle of food he takes into his mouth, to poison the stomach and the whole system, probably resulting in a slow, gradual death.

What a shame, what an abomination

for such a condition to be allowed to exist in our modern twentieth-century civilization! The average bridge work is a crime against civilization, against enlightened humanity.

Examine the mouth of any acquaintance—be he physician, lawyer, editor, or manufacturer. What condition is it in? The gums are highly inflamed and bleeding from our fixed bridge work. Raise the lips and cheeks, and you will find one or more fistulas, not to mention the blind abscesses that only the searching roentgen ray will disclose. These fistulas, produced by our root-canal work or mechanical trauma produced by the insertion of our bridge work, etc., discharge pus constantly into the system. The breath is unbearable, the patient possibly suffering from other ills to which the condition of his mouth has undoubtedly been a great contributing factor. And all this the handiwork and under the supervision of graduate dentists!

PREVENTION THE HOPE OF THE FUTURE.

Restorative dentistry, outside of fillings and inlays in vital teeth, is almost hopeless. Restorative dentistry must give way to preventive dentistry. If we would refuse to devitalize teeth, if the law forbade us to devitalize teeth, the profession and the people would be a thousand times better off!

It is much easier to extinguish a fire with a pail of water at its inception than to allow the fire to take its course and then send an alarm for high-pressure fire-engines. It takes us a few hours to devitalize a tooth and fill it, not considering the pain the patient has to undergo, while then only a certain percentage of this work is good. But it takes very little time and little pain to the patient to excavate a small cavity and fill it with amalgam or gold, with a positive 100 per cent. result.

We are wasting much of our energy and inflicting inconceivable damage to the health of our patients by following our stupid and childlike methods of the present.

Until we can prevent the havoc of dental caries by finding its true etiology and means of combating it, the only means at our command are prophylaxis and prevention.

An individual's health should not be left to his own care. People are ignorant and careless concerning their health and only apply to us for help when the damage is done beyond repair.

SOCIALIZATION OF MEDICINE AND DENTISTRY.

It is high time for the socialization of medicine and dentistry. We may allow an individual to struggle for an existence if we believe that justifiable. But we commit an unpardonable crime if we allow them to struggle in the care and maintenance of their health.

It is the duty of a democratic government to see to it that all its citizens are enjoying perfect health. The vitality and health of its citizens is the cornerstone upon which the entire superstructure of government rests.

Our Government saw fit during the recent war to ask thousands of its male citizens to sacrifice their lives for world democracy on the principle of all for one and one for all. This being the case, does it not necessarily follow that it is the duty of the Government to take care of the health of its people, of whom it asks such a supreme sacrifice? Everything possible should be done to see to it that all citizens enjoy perfect health and that proper means be taken for the elimination of all factors interfering with the accomplishment of this ideal. In doing this, the Government will not only do a great humanitarian service in the prevention of unnecessary suffering and preventable diseases for the people to whom it owes its existence, but it will also establish a solid foundation for its own perpetuation.

The Government established a Board of Health to protect the people against contagious diseases whenever they are present. Why not go a step farther, and supervise their health while they are apparently well? It will certainly be a

great economic gain, and a humanitarian act in accordance with our proclaimed principles of world democracy.

Our children receive instruction at the expense of the Government; the municipalities defray from the public purse expenses incurred in the maintenance of a good water supply, fire department, police department, and street-cleaning department. Why not take care of the health of the people in the same manner?

Every individual should be forced to undergo a physical examination at certain intervals by experts designated by the Government, and corrective measures advised and even enforced. The children's teeth should be taken care of from the time they are three years of age. When they enter school at six, their deciduous and permanent teeth should be watched, and filled before exposures of the pulps result. This work should be done by dentists paid by the Government, in dental clinics attached to every school. The dangers of pulp exposure and focal infection should be brought home to the children in school by special lectures. Lessons in oral hygiene should be arranged for them at this age, when habit is becoming second nature.

In doing this we shall have very few extractions and devitalizations, with no need for septic restorations. The children should be supplied with toothbrushes and dental pastes by the Government. The majority of people are too poor or too ignorant to take care of their children and to supply them with these commodities.

Dentists and physicians should be the servants of the Government and the people, employed on a salary, and there should be possibilities for advancement according to ability and number of years of service, as is the case at present in the army and navy.

The dental and medical professions will surely have no objection to this plan, as they will have nothing to lose. They would receive a fair salary with chances for advancement. They would work only a certain number of hours, and be

provided for in sickness and old age—the worry of all professional men. There would be no enslaving competition, no worry about making a living, no “watching” at the office for eight or ten hours a day, as is the case with physicians and dentists.

Consider all the saving in rents, electricity, telephones, help, etc. What a saving of human energy! What a saving in health and happiness! The Government could erect large buildings for the different branches and specialties of medicine and dentistry where all citizens could be treated gratis, with no stigma of charity attaching as it does today.

The Government could defray its expenses through suitable taxation, with which the people would gladly comply, as it would cost them less in the long run. There is no reason why an individual should be allowed to suffer all the stings of an impoverished health acquired through ignorance and through no particular fault of his. Society is responsible for it, and society should take care of it from the public purse.

In the socialization of medicine and dentistry we shall eliminate all the existing medical and dental evils at one stroke, both the public and the profession being the beneficiaries. No more charlatans, quacks, and illegitimate practitioners to mulct the public, no more patent medicines and nostrums to sap the life of the nation. We shall then reach the ideal toward which we are all striving, namely, to put the profession upon an altruistic, exalted pedestal for the benefit of afflicted and suffering humanity.

I would suggest that the Government should open schools for many of our maimed and incapacitated soldiers returned from “over there,” in which they should be trained as dental hygienists to take care of the children’s teeth at school and to assist dentists in their work. These heroes who have sacrificed their limbs certainly deserve our appreciation, and we should show it by teaching them something remunerative, constructive, and uplifting. This will make them realize that they are still doing a great service to mankind and that their lives are still worth while.

The Government purchased thousands of dental outfits for the front and at home for our cantonments. As soon as the war is over, let the Government turn over these outfits to the public schools, and let schools be opened immediately in which these crippled soldiers can be educated as dental hygienists to take care of our children’s teeth under Federal supervision.

In doing this everybody will be benefited. The crippled soldiers will be provided with good remunerative work, and the children who in the future are to have the reins of government in their hands will benefit by enjoying a good masticatory apparatus and sound health.

Dr. Beach and the Preparedness League of American Dentists are pre-eminently best qualified to bring this to the attention of our Government. Here is a grand opportunity for this patriotic organization. Will they take advantage of it?

168 HOOPER ST.

A Plea on Behalf of American Dentistry.

By Dr. ALBERT NAHAS, Alexandria, Egypt.

DOES American dentistry need an advocate? Anyone in close touch with the progress of dental science in America, the collective work of dental schools and dental societies for scientific research, the individual efforts of every dentist and the wide emulation of the dental profession, may question it.

And yet Dr. Hunter's article "The Rôle of Sepsis and Antisepsis in Medicine," as reproduced in the July 1918 number of the DENTAL COSMOS, is the greatest rebuke the dental profession has received from the day of its birth. It lays at our door the blame for almost all possible infections:

The worst cases of anemia, gastritis, colitis of all kinds and degrees, of obscure fever of unknown origin, of purpura, of nervous disturbances of all kinds ranging from mental depression up to actual lesions of the cord, of chronic rheumatic affections, of kidney disease, are those which owe their origin to, or are greatly complicated by, the oral sepsis produced in private patients by these gold traps of sepsis. . . . In no class of patients [Dr. Hunter goes on to say] and in no country are these in my observation more common than among Americans and in America.

I do not know how extensive was the observation of Dr. Hunter in America, but he seems to have overlooked England entirely.

For the last three years I have been in constant touch with patients from the British forces in Egypt. I have had under my care English, Scotch, and Irish soldiers and officers, Australians, New Zealanders, and Canadians too, and I could easily tell at a glance—just a superficial survey of the mouth—whether the patient hailed from the British colonies or the British Isles. The latter

presented as a rule the most appalling conditions, and Dr. Hunter's article may verily apply to them. At any rate this condition is not to be blamed on the "high-class American dentistry," but on American dentistry as practiced in England.

There are three inherent faults in English dentistry:

First and foremost, the preservation at all costs of decaying roots; in Dr. Hunter's own words, "a sepsis at the worst covered by plates, which they have been told not to remove! covering septic roots which they have been told to keep! in order to prevent falling-in of the gums."

Second, the multiplication of amalgam fillings until the tooth is nothing but a mass of amalgam—with fissures to indicate the separate fillings (a total ignorance of the necessity of beveling the enamel rods causing these fissures), and a total absence of contact point, rendering the tooth absolutely unfit to crown in the future.

Third, the use of ready-made crowns over undevitalized teeth. The tooth is hardly ground, the enamel is nearly all left, and the gingival part of the crown, bulging out as a consequence, cannot fit the root properly. Flat occlusal surface and flat proximal surfaces are other important features of these crowns.

No wonder Dr. Hunter's opinion is so very unfavorable to the profession, but why is the blame thrown on American dentistry?

It is very simple. Everyone knows that in Europe American dentistry stands for what is best and what is worst. The popularity and success of the first American dentists there brought

out a crop of fake American dentists who had never even seen the States. American diplomas were faked and sold—and to this day this practice has not been discontinued. American diplomas made in New York are still on the market today.

Circulars were received last year by dentists in Egypt from a so-called Post-Graduate School on Broadway. The following is a literal translation of one of the printed forms sent out along with circulars, rules, and printed forms, all in bad French and full of mistakes in spelling:

POST-GRADUATE SCHOOL,
1947 BROADWAY, NEW YORK.

Mr. Secretary,—Enclosed you will find ten dollars (\$10) in payment of first instalment for the course "Modern Dentistry," for which I pledge myself to pay fifty dollars for value received as follows: Ten dollars in advance, ten a month while the course lasts.

It is understood that I shall have to study during five months, and that when I finish the course in a satisfactory way in December I shall receive an artistic diploma as D.D.S.

Date
Name
Age *Nationality*

If dental societies, state boards, and the profession at large find that state of affairs satisfactory, let them not be surprised at such articles as Dr. Hunter's!

One more word on the common use of the title "American dentist" in Europe. What does it really stand for? It does not represent a recognized degree anywhere; but in Europe it is a symbol that would fain represent dental learning as taught in the United States, and it is the duty of the dental schools and the profession to repudiate the assumption.

Some years ago a quack in Paris (in French quack is *charlatan*) was brought before the court by the "Syndicat des dentistes" for using the French title *Chirurgien Dentiste* illegally. The title on that man's doorplate was written thus *Chⁿ Dentiste*. The man protested, and begged the court to realize that *Chⁿ Dentiste* might stand for *Charlatan Dentiste* as well as for *Chirurgien Dentiste*. This is just the status of the American dentist in Europe today—he may be a good man or a quack; it is necessary for the people to differentiate.

A Contribution to the Morphogeny of the "Dens in Dente."

By Dr. TH. E. DE JONGE COHEN, Utrecht, Holland,

ASSISTANT PROFESSOR DENTAL DEPARTMENT, STATE UNIVERSITY OF UTRECHT.

THE subject which I am about to consider is not a new one. The first description of the *dens in dente* dates back twenty years, yet when I add that this first description also has been the only one so far recorded, it is clear that this form-deviation is a rare anomaly. It was a very happy coincidence that during a research of the root differentiation of the bicuspid, I not only had the opportunity to see the deviation in its purest form, but also could follow up, by a series of preparations, the development of the dens in dente.

The first person to occupy himself with the description and explanation of the dens in dente was Professor Busch, who described three cases: A central incisor and a supernumerary incisor of the upper jaw, and a lateral incisor of the lower jaw. In all three cases the lingual half of the tooth, the "deuteronere," was so fully developed that even in the case of the lower incisor—this surely being an exceptionally rare appearance—an independent lingual knob was visible on the crown of the tooth.

At this point we may note that Busch himself does not attribute any connection between the last-named anomaly and the development of the dens in dente; on the contrary, he considers the strong development of the lingual half of the three described incisors—with the exception of one case—as a manifestation of coalescence. The dens in dente he considers as an anomaly resulting from one tooth structure having built itself circularly around the other.

This hypothesis is not confirmed by a single positive argument; on the con-

trary, it seems to be contradicted by the presence of a radicular covering of enamel of the dens in dente. The difficulty, however, is removed as soon as we apply to the dens in dente the partial appearance of the process of deviation of form, of which we shall speak later.

I myself have noticed the dens in dente, not only with the incisors, but also with the lower first bicuspid. As in the cases of Busch, I noticed the development of the dens in dente so constantly to go hand in hand with the deuteronere that the question seemed to arise as to whether the coincidence of dens in dente with the progressive development of form of the lingual aspect of the tooth would not have a definite meaning. The following discussion of the nature of this development will give us an opportunity to answer that question.

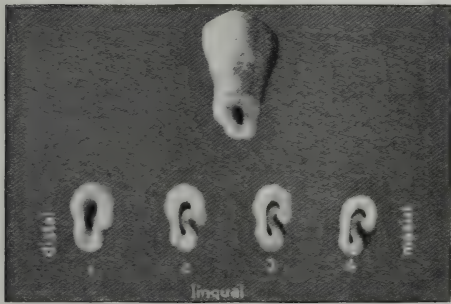
In most textbooks on dental anatomy the lower bicuspid is simply called single-rooted teeth. This is correct if we confine ourselves strictly to description of form—for plural, entirely separated roots very seldom appear in the lower bicuspid. More frequently, especially with the first bicuspid, we find incomplete bifurcation of the root.

As indicated by illustrations in textbooks and in sectional preparations, we find this bifurcation proceeding constantly from the mesial side of the root, with the exception of some rare deviations. (Fig. 1, "1" and "2.") Thus it is that in a further stage only a very thin septum remains mesio-distally ("3" and "4"), which still forms a connection between the protomere and the deuteronere. Only when this septum disap-

pears can we speak of a buccal and lingual root, but such a division is very seldom seen. Besides this, we find as a second progression the bifurcation of the buccal aspect of the root into a mesio- and disto-buccal root, so that in the final stage of the root-differentiation we find complete bifurcation into two buccal roots and one lingual root.

So much for the normal appearances of bifurcation. As said before, the bifurcation proceeding from the mesial is primary. We may find some small deviations in the historic course of the described progression, but they are of

FIG. 1.



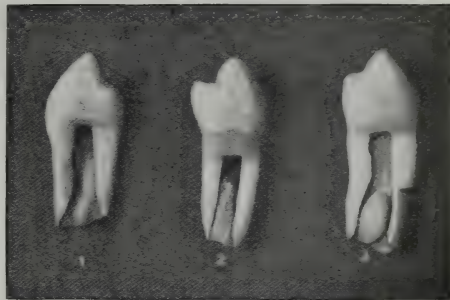
Horizontal cut through the root of the lower first bicuspid.

minor importance and thus may be left out of consideration. The main thing is that it is an established fact that the mesial wall of the root, which in horizontal diameter originally produces a very slightly bent line bucco-lingually, begins to dip in at a point one-third from the lingual, which consequently changes the entire aspect of the corresponding pulp of the root. So much as to the horizontal diameter.

Now suppose we take the bucco-lingual diameter of the root, in such a way, however, that the mesial dipping-in remains intact; this as a rule seems to be possible only with the young cases where the chance for a partial or complete obturation of the pulp is almost entirely excluded. Here we notice that this dipping-in is forming, as it were,

a cloak of bone* within the pulp, whose aspect changes according to the stage of development which this cloak of bone has reached. (See Fig. 2, "1," "2," and "3.")

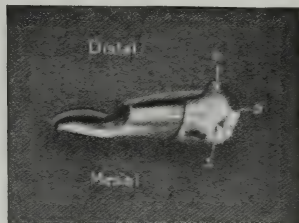
FIG. 2.



Bucco-lingual cut through the root of the lower first bicuspid.

If we look at this cloak mesio-distally, we have the diameter as shown in Fig. 3. Thus we find a cloak of bone which over its entire height is no longer connected with the mesial wall of the root; that is,

FIG. 3.



Mesio-distal cut.

it has partly separated itself because of the dipping-in.

In case this separation continued up to the apex, it seems clear that within the lumen of the root a new secondary root must have been formed, which like the primary root will consist of dentin and cementum. If this hypothesis be true, then we have the cementum of the

* Histologically, this cloak, of course, does not consist of bone tissue, but of dentin and cementum.

secondary root, the dens in dente, located centrally to the dentin covering.

FIG. 4.

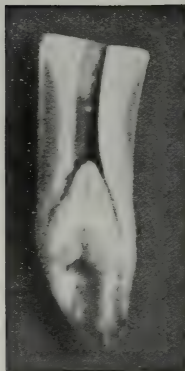


In order to better follow up the dens in dente toward the crown of the tooth, the bucco-apical part of the root has been removed.

which a secondary root had been formed entirely free within the pulp space. Not only was the cementum of the secondary root on its periphery covered with dentin, but a second important indication for the correctness of my interpretation was the locality of the secondary root, which, although entirely free within the primary, was not situated in the same axis, but moved over so far mesially that the two mesial walls of the roots nearly touched each other, especially where the dipping-in and the separation must have taken place. (See Fig. 4.)

Busch also points out in a description of his cases as to the topography of both roots: "The microscopic examination of the tooth sections, as well as the photographs, shows us clearly that here indeed we have one tooth structure built circularly around the other. The most remarkable connection consists, however, in that the cementum of the outside tooth structure was located outwardly,

FIG. 5.



A



B

Lingual and buccal half of the matured dens in dente.

In fact, I have found in the collection of Professor Bolk a lower bicuspid in

while that of the inside tooth structure was located inwardly. The relation be-

tween the two teeth was like that of two fingers of a glove, one being pushed into the other, in such a way, however, that the inner finger had first been reversed, so that its shiny surface was turned to the inside. On the side of the dentin both tooth structures were partly united and partly leaving an open space between them, which during advanced life was filled with white pulp tissue." I shall not go into a discussion of the incisors, as Dr. Van Loon has taken this subject for his study not long ago.

The question whether we shall find the dens in dente as well in the crown as in the root of a tooth depends entirely on the nature of the differentiation, and thus we notice that with the bicuspid the dens in dente remains located in the lower half of the root, while with the incisors, where the dipping-in is developing from the incisal edge to the apex, naturally we shall find the described deviation in the crown also.

Finally, I have to remark that the cases of Busch, as well as my own, are distinguished by the fact that in none of them do we find the apex entirely closed. I am justified, therefore, in raising the question: What will be the influence exerted by the development of the primary on the form of the secondary root? Will the latter remain indeed entirely free in the primary? In this we are aided by a study of the tooth formation of the bicuspid. Here there is a bending of the secondary cloak of bone on three sides, buccal, distal, and lingual, corresponding to the planes of the primary root; and so we have, in case the cloak of bone sep-

arates itself mesially (and thus also comes to lie with its mesial surface entirely free in the primary root), a bending around into the corresponding plane of the primary root.

Thus we have, instead of a more or less conically ending apex, or root point, a dipping-in, which can be best com-

FIG. 6.



pared with the bottom of a bottle. Two illustrations of this formation are shown in Figs. 5 and 6. One has been laid open in a sagittal direction. Dr. Bakker of Amsterdam has been so kind as to radiograph the other (Fig. 6). In both cases it will be noticed that the secondary root—dens in dente—also in matured stage, remains hollow, the excavation ending above in a rather sharp point, just as the dens in dente itself.

[AN interesting case of "dens in dente" was described by Dr. E. C. Kirk in the DENTAL COSMOS for June 1918.—ED.]

CORRESPONDENCE

"The Dental Clinic in the National Army Cantonment."

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—I have noted with interest some of the statements contained in the contribution made by Mr. Malcolm W. Bayley, Louisville, Ky., to the DENTAL COSMOS of August 1918, page 704, entitled "The Dental Clinic in the National Army Cantonment." They are interesting inasmuch as they are in part contradictory to existing military dental legislation, and as being open for debate in other respects.

He states, in quoting Lieut. Neil J. McCollum, D.C., that "The present law provides one dental surgeon for every 1000 enlisted men." This is misleading as to the true strength of the present authorized number in the regular dental corps, and therefore fails to give a correct estimate of their ability to cope with the dental needs of the regular army. The 1917 legislation actually provided for one dental officer for every 1000 *total* strength of the regular army. This included both enlisted men and officers. Or, in other words, one dental officer is required to attend to the needs of every 1000 persons in the regular army, which number is made up of officers and enlisted men.

He quotes also from Lieut. John O. Lessig of Philadelphia as follows: "Dental treatment should be the same in the army as in private practice—careful and proper treatment no matter what the operation is. It should be given our most conscientious attention, and we should execute the work with the utmost care and skill we possess." No one will dare contradict this as a fundamental in determining the capability of a dental officer at all times, no more than any

dental surgeon, either civilian or officer, is excused from following the principles outlined in a further quotation from Lieut. McCollum: "All fillings are carved to conform to the natural outlines of the tooth as nearly as practicable, being careful always to restore marginal ridges, cusp, sulci, grooves, etc." We will accept the last two quotations as standards to be observed by every dental officer of the regular army at all times.

We have shown that one dental officer is required to render this standard of service to every 1000 persons (officers and enlisted men) in the regular army. Then a natural question which arises is, How far can this dental officer meet this requirement in the length of time he is allowed?

Before attempting to answer this question, let me show what time he is *allowed*. All men who enlist in the regular army under the present peace time laws enlist for a period of four years' *active* service, and three years in the reserves. We have, then, *four* years in which to render such service to the enlisted portion of that 1000 men. Having accepted a standard for our work, and having determined the *time allowed* to perform this work, we should next determine the amount of work to be done.

I have served in the past five years with the Coast Artillery corps (white soldiers), the Philippine Scouts (Filipino soldiers), and the Ninth Cavalry (negro soldiers). For my own personal information I have conducted surveys of the mouths of the men where I have served with a view to determining this very point. We shall consider only the

American soldier (white and black), however, in this determination. The findings of my records to date show that these men have an average of less than *two* cavities for fillings per man per total strength of any organization, good, bad, or indifferent. We will allow a margin here, however, and call it *two* cavities per man.

I feel sure that the records in the Surgeon-general's office for the past five years will support me in the statement that one dental officer, operating according to these accepted standards, and working *four* or *five* hours per day, can perform an average of 100 such fillings per month.

Thus we have an equation which may be presented like this:

1000 men = 2000 fillings.

1 dental officer for this 1000 men, or 2000 fillings.

Time allowed to perform this number of fillings = 4 years.

Capacity of dental officer = 1200 fillings a year.

Capacity of dental officer for 4 years = 4800 fillings.

Capacity of dental officer = 2800 fillings in excess of total number of fillings originally found.

It will be seen, then, that the normal ability of this dental officer allows for 2800 new cavities to present themselves in the mouths of 1000 men in 4 years. Personally, I do not believe that we shall find an increase as large as this; others may believe differently. To these I would like to say that many of the cavities accepted for fillings when these men first enlisted will terminate in extractions before the end of this 4 years of *active* service, thereby reducing the original 2000 fillings that much. You must remember also that the officer is not changed every 4 years, which further reduces the number of fillings for the succeeding years. Also, about one-third of these enlisted men will re-enlist for a second and third period, thereby greatly reducing these figures further.

To me this argues very clearly that one dental officer per 1000 *total* strength of the army, working 4 or 5 hours per

day, can perform with ease the dental requirements of 1000 persons in the army, once we have a corps completely filled and conditions again normal.

These figures are not presented as an argument against a legitimate further increase in the present dental corps. But it is not seen why we need a dental corps of twice or three times its present strength. In the reorganization of our army we should have a certain number of dental officers whose duty should be purely administrative. We surely need a further increase sufficient to replace this number of officers who will not operate at the chair, so as to have one operating officer for every 1000 persons.

This average of operations per month for each dental officer conforms very closely with the report of Major Mann from Camp Zachary Taylor for the month of December 1917.

The records of my surveys, as verified by the completed records of these same cases, when I was stationed alone, and the records of the entire office when I was stationed with other dental officers, take issue strongly with the opinions of Lieut. McCollum when he says, "I believe that the national army recruits will require, on an average, four fillings each." I cannot understand why there should be this great difference between enlisted men of the national army and of the regular army.

I do not know how many hours per day Lieut. McCollum was operating, but I cannot imagine any dental surgeon performing an average of 13 fillings per day if he is operating only 4 or 5 hours per day, and complying with the standards previously accepted for all operations. Yet he is quoted as saying, "An army dental surgeon, in order to give the proper attention to each and every man under his command, would have to complete about 13 fillings per day on an average, counting 300 working days in the year, to finish his work in this time." Why does he feel the necessity of completing in one year what he is allowed 4 years to perform? His natural reply will be, Why allow those cavities to stand one, two, or three years longer? Why

not fill them as early as possible? To all of which I must reply, Certainly, let us fill them as quickly as possible; but why should we feel the need of making "as quickly as possible" mean one year? How does he intend to employ his time during the second, third, and fourth years that he remains in the army? If he claims that he is capable of performing this number of fillings in 300 working days and do them as they should be done, and work only 4 or 5 hours per

day, then he is a living argument for a dental corps composed of only one-fourth of its present authorized strength.

My authority for a four- or five-hour working day is based on the hours I have been required to observe for the past three years in the Philippine department, viz, from 8 A.M. to 12 M. or 1 P.M.

C. G. BAKER,

Major, Dental Corps, U. S. Army.

The Diet and Teeth of the Natives of Turks Islands, British West Indies.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—I have on more than one occasion read articles showing the relationship between diet and strong and healthy teeth. The fact that in days gone by, before man became so fastidious as to the pleasing of his palate rather than the satisfying of his stomach, his teeth were stronger and caries not so frequent as in this era, is no doubt well established. However, I take pleasure in writing this brief communication on the habits and diet of the inhabitants of these islands, who I find are remarkable for their strong teeth as well as their splendid physique.

Their diet consists principally of fish and corn. It is safe to say that they eat fresh fish (including shell-fish) on an average of three times a week, and corn, in the shape of hominy and sometimes roasted on the cob, at least once a day. Vegetables such as potatoes, cabbage, pumpkin, and cassava are extensively used. Meats, except turtle, are only had occasionally. Very little milk is to be obtained, and cereals are practically unknown. Oranges, grapefruit, mangos, custard-apples, sugar-cane, bananas, sweetsop, and a few other native fruits are used in proportion to their abun-

dance, and just about balance their requirements.

Hygiene is an unknown quantity, but strange to say, although few of them possess toothbrushes, they do make an effort at mouth cleanliness. The dentifrice is ordinary sea-water, which is abundant and always within easy reach. I have often watched them rubbing their teeth and gums with the forefinger, using sea-water as a wash. Most of those who have come under my observation have considerable calculus deposit on their teeth, but caries is rare. It is not uncommon to see an individual approaching the age characterized as second childhood with thirty-two teeth any one of which from appearance would require considerable effort to extract.

Their teeth, generally speaking, are strongly developed and exceed the average length of roots as shown in Broome's Dental Anatomy. Without doubt, their diet, which necessitates considerable chewing and exercise of the teeth, contributes largely to the excellence of these organs. I also feel sure that the frequent use of sea-water as a wash is by no means a small contributing factor. I have adopted the use of sea-water in my mouth toilet, and also use it for

cleansing my toothbrush. Fine crystals of salt ($\text{NaCl} + \text{Ca}$ and Mg carbonates and impurities) deposit on the bristles of the brush between uses, and produce a pleasing effect in subsequent use. Some

of our naval friends should try this, and note results.

Yours truly,

C. ERIC ASTWOOD, D.D.S.

TURKS ISLANDS, BR. WEST INDIES.

"Painless Pulp Extirpation; Fractured Roots Remaining in the Jaw."

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—I offer the following in reply to Dr. Herman Ausubel's questions in the January DENTAL COSMOS, page 69.

(1) For want of a more plausible explanation of the first question, and which likewise holds good for the same occurrence under conduction anesthesia, my theory is that as the nerves of the pulp are the last fibers or ending fibers of the nerve, they are located centrally in the bundle of fibers comprising the nerve. Unless the anesthetic is of sufficient strength or quantity, or both, as the case may require, it will fail to penetrate the nerve deeply enough to affect the innermost fibers, hence the result noted in the doctor's experience.

It may be, where he infiltrates and gets no anesthesia of the pulp, that in addition some physical condition present, a dense alveolus, for example, may prevent the anesthetic from reaching the desired goal.

In similar occurrences with conduction anesthesia the writer finds it possible to excavate almost, if not actually, to the pulp, and then, meeting sensation, a drop of the anesthetic applied to the pulp even without pressure produces the desired result in about one minute.

(2) In regard to the second problem, I fail to see the difference in condition between a tooth which is left in the jaw with its root-end amputated, and in the case mentioned, where a root-end has the tooth amputated (fractured in extraction) from it. Of course, in the former instance, an aseptis in operating is pre-

sumed, and in the second instance, if the root-end and the canal were not infected aseptis may again be presumed if a copious blood flow and the protective blood-clot be considered. In the first instance bone is expected to form in the space left after amputating the root-end. In the second instance, I can recall no case where it has been necessary to cut through solid bone to reach the surface of the root, even years after. As to after-effects on the patient, these can only be surmised, and are dependent on supposititious conditions. A portion of pulp left in the root portion may persist in vitality and cause undesirable reflexes. Again, the pulp portion may die and the usual sequelæ result. If the root-end was infected in the first place, the questions concerning focal infection are involved.

There are of course numerous other premises that may be considered and which will undoubtedly occur to the reader, but by far, to me, the most important consideration is that when cases of this kind occur and the broken portion cannot for some reason be immediately removed, the patient be not left in ignorance of the situation, and that the socket be properly packed and re-packed, an X-ray taken, and provision made for early removal. In this way the operator affords himself full legal protection.

Respectfully,

PHILIP SCHEIMAN, D.D.S.

FLUSHING, L. I., N. Y.

"A Trouble in the Casting of Gold Inlays."

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—I have before me the January issue of the DENTAL COSMOS, and note an inquiry from Dr. J. C. Swan, on page 70, entitled "A Trouble in the Casting of Gold Inlays," regarding small holes occurring in castings of gold near the sprue.

With reference to this I beg to refer the doctor to an article that appeared in COSMOS, May 1915, under my name.

Respectfully,

MARCUS L. WARD.

ANN ARBOR, MICH.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—My solution of "A Trouble in the Casting of Gold Inlays" is as follows:

In simple inlay casting I use a cold flask, with a shallow crucible, to avoid re-heating the investment to the depth of the mold while melting the gold.

In compound inlay casting, such as post inlays for cavities, crown bases, etc., I cast with a hot flask, continuing the heat on the nugget about two seconds after opening the vacuum.

Very truly yours,

E. A. BONAR.

CLAY CENTER, KANS.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—In reply to Dr. J. C. Swan's inquiry in the January issue of the DENTAL COSMOS *re* "blow holes" at the point of contact between sprue and inlay, I may suggest that the trouble lies in keeping the flame on the nugget after the pressure is applied. This has a tendency to draw the gold from the inlay proper.

I should like Dr. Swan to try removing the flame at the instant of "casting," and note the results.

Yours truly,

ARTHUR RENNICK.

1171 W. 141ST ST., NEW YORK, N. Y.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Replying to the inquiry of Dr. J. C. Swan, Hastings, N. Z., as to the cause of incomplete cast of inlay at the junction of sprue and inlay: Having had some trouble in the past of the same nature I would suggest that Dr. Swan use a smaller sprue, or if not a smaller one, not to insert it so far into the inlay model. I use as a sprue a contra-angle bur ground to a point, and insert just far enough into the model to stick.

Yours truly,

H. W. TITUS, D.M.D.

COTTAGE GROVE, OREGON.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Replying to Dr. J. C. Swan's query regarding the cause of small holes occurring at the "sprue" in cast gold inlays, my observation has led me to believe this trouble to be due largely to the use of too small a sprue wire as compared with the size of the inlay to be cast. The air-pressure, which is sudden, actually forces a hole down through the melted gold, and a bubble or two of air is forced in. If the sprue hole is larger there is a greater movement of gold and less likelihood of forcing any air through. Bubbles such as described never occur in casting small patterns.

If the following rules are observed, this trouble will not be experienced:

(1) Regulate the size of the sprue wire according to the size of the pattern to be cast, varying from small wires for small patterns to No. 14 wire for casting cusps, dummies, or large molar inlays—remembering that there is more danger of the sprue being too small than too large.

(2) Melt enough gold to approximate double the amount required for the cast.

(3) Do not release the air-pressure until the gold has solidified.

Very truly yours,

J. H. HARRISON.

HAZLETON, PA.

"Trench Mouth and Its Treatment."

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—In reference to the article that appeared in the January 1919 DENTAL COSMOS, on "Trench Mouth and Its Treatment," by Joseph E. Redden, I wish to make a few observations. Judging by the symptoms given describing this infection, the so-called "trench mouth" is an ordinary case of stomatitis ulcerosa. It is certainly a fact that lack of oral prophylaxis favors the development of the infection, but no matter how clean a mouth may be, if infected by the bacilli of stomatitis, the infection will develop regardless of tartar accumulations, as we often see in clean mouths of very young children, in whom this infection is noticed more often than in adults.

As to treatment, the careful application of nitric acid to the ulcerated gums will produce immediate relief—to such an extent that the patient leaves the of-

fice in a greatly relieved condition. The nitric acid application is very painful for the moment, but the immediate after-effects are so grateful to the sufferer that he willingly returns the next day for further treatment. The applications are made with a small pledget of cotton attached to the point of a toothpick. About five or six treatments, one daily, will effect a complete cure in almost every case.

I do not advise the scaling of the teeth until the patient is practically recovered, as my experience is that scaling, during the acute period, aggravates the symptoms and makes the treatment more difficult and prolonged, as the instruments used in scaling carry the infection lower down into the gum pockets, where the nitric acid cannot be readily carried.

FRANCIS ESCHAUZIER, D.D.S.

SAN LUIS POTOSI, MEX.

PROCEEDINGS OF SOCIETIES

Academy of Stomatology of Philadelphia.

Annual Meeting, held December 19, 1918.

THE annual meeting of the Academy of Stomatology of Philadelphia was held on Thursday evening, December 19, 1918, in the Café Arcadia.

Before the meeting the annual dinner given by the society was participated in by the members and guests of the society, after which the business of the evening was taken up.

The minutes of the previous meeting were read by the secretary and approved.

The report of the Council was also read and approved.

The report of the Treasurer was read, and the president appointed Drs. Denney and Tuttle as an Auditing Committee.

A service flag containing nineteen stars was unfurled by the president.

Dr. SAUSSER moved that a committee of three be appointed to learn if Dr. Aller's death entitled the society to a gold star, and if so, that the committee be empowered to put a gold star on the flag in honor of Dr. Aller.

Dr. KANAGA read the resolutions drawn up on the death of Dr. Aller. A motion that the resolutions be accepted was carried.

Dr. W. Stirling Hewitt was elected as a member of the Council.

The speaker of the evening, Dr. C. S. VAN HORN of Bloomsburg, Pa., was then introduced, and read a paper en-

titled "Considering the Wax Pattern." [This paper is printed in full at page 204 of the present issue of the DENTAL COSMOS.]

DISCUSSION.

Dr. Dudley Guilford. When Dr. Taggart first gave to the profession his discovery of an improved process for making cast gold inlays, we immediately recognized the great advantages possessed by this new method, and there was at once a great vogue for the cast gold inlay. After a number of years the cast gold inlay began to be criticized rather severely, and often very justly. Now let us consider the advantages and disadvantages of this method.

In the first place, we have a method by which it is possible to very beautifully restore the exact anatomical form of the tooth; in the second place, we have an absolutely dense filling, and in the third, we have a method much less trying and fatiguing to both patient and operator.

Now, what disadvantages have we? As far as I can see, only one, and that is the disadvantage Dr. Van Horn has pointed out this evening, the disadvantage of lack of precision. Unfortunately a cast gold inlay which lacks precision—and some do very markedly—can be placed in a cavity and, with a good cement, it will stay there; and also unfortunately we have some operators whose standard is no higher than the standard of some newspapers, and that is, to give the public what it wants. The

average layman judges a filling by whether it stays in or comes out. If it stays in, it is all right; if it comes out, it is not. Now, we know that a great many fillings that stay in are far from all right, and that they do the patient more harm than if they had come out. For that reason the cast gold inlay has come into disrepute. We all know the inlay with a wide cement line at the cervical margin and we know that this will wash out later, inducing decay, with involvement of the pulp and loss of the tooth in many cases.

If this matter of lack of precision can be overcome I see no reason why the cast gold inlay cannot be made a perfect filling, and I believe that it will. Dr. Van Horn has, in my opinion, done as much as any other one man to bring about this desired result. It is very evident what is the main trouble with the ordinary technique. Suppose we have a pattern which fits the cavity exactly, we take it out of the cavity at 98° , and it is invested at 20° to 30° less than this temperature. We know that all materials shrink when chilled and expand when heated. It is evident, then, that the pattern is smaller than the cavity when it is invested, and so is the mold made from it. We cast into that mold gold at a temperature of approximately 2000° . The gold fits the mold when it is at 2000° ; but before being placed in the mouth there is a drop in temperature of about 1900° . Gold, like everything else, will shrink when the temperature is reduced, so we have a double shrinkage, one in the pattern and one in the gold. That is the main but not the only reason why we do not have perfect results.

Dr. Van Horn is scientific. His logic is above reproach. His idea is to expand the wax pattern sufficiently to overcome the shrinkage in the gold. Fortunately wax has a greater coefficient of expansion than gold, otherwise it would be impossible to do this. We have a reduction in temperature in the gold of 1900° , while it is only practical to raise the temperature of inlay wax approximately 20° above mouth temperature.

I wish that Dr. Van Horn had given

us more definite figures tonight, and if he can, I wish he would do so later. That is to say, I should like him to tell us this: If we take a certain wax, raise it to a certain temperature, use a certain investment material, invest the wax at a certain temperature, and cast it in a flask which is at a certain temperature, what result shall we get? That is what we need, and that is what we are coming to, in my opinion. This, gentlemen, I think, should be worked out so that it would be an exact mathematical problem. Given the coefficient of expansion of the wax and the coefficient of expansion of gold, and the change in the investment when it is heated, which is not known, we could determine the temperature at which the wax should be invested, and the temperature of the flask at which the casting should be made, with mathematical precision.

In conclusion, I would say that Dr. Van Horn has given us a *résumé* of his work which is a long step in the right direction. This evening, speaking to him about this matter, we agreed that the whole field has not been covered. That is, there are a great many points about the changes which take place in the flask before and during heating, the length of time that it should set, the length of time it should be heated, and the temperature at which it should be cast, which must be worked out and can best be worked out in a research laboratory.

Dr. W. J. Robinson. I am much interested in the standardizer that Dr. Van Horn has shown; as to its practicability we must judge that individually. As the purpose of this device appears to be to expand the wax pattern by means of heat, in order to compensate for the shrinkage of the gold casting, I would like to know what provision is made for realizing the difference in temperature necessary in heating different sizes of wax. These have different degrees of expansion, and a definite degree of temperature would have to be worked out for each block of wax. Can this be done with the appliance Dr. Van Horn has shown us?

I cannot agree with the author that

the wax tray and liquid-wax method is the simplest and most accurate in my hands. The simplest and most accurate method is the so-called indirect-direct method, so named because the wax pattern after being made on the model is tried in the tooth cavity, and the finishing touches made in this position. This method is successfully used by many.

I have used the wax tray and liquid-wax method when it was first introduced by Dr. Van Horn, and tried to use it intelligently, but the technique to me was much more complicated than the indirect-direct method, and as I could not get any better results than with the indirect-direct method, I returned to the latter. I do not see how the liquid wax when painted on the so-called wax tray and returned to the cavity will not mush out, as it has nothing to confine it, and because of this mushing out there is a lack of condensation, and to get a well-defined margin the wax must be condensed.

The cavities that Dr. Van Horn speaks of as the most difficult, when the indirect-direct method is used are changed to simple; even the M. O. D. cavity with this method is no more to be dreaded than the simplest form of cavity. Occasionally I am tempted to resort to the direct method of pattern-making when I have a cavity that is very easy of access. If it be a so-called compound or complicated cavity I resort to the use of a matrix, as I do not see how a pattern can be made in such a cavity without one. When using the direct method, to prevent the mushing-out which Dr. Van Horn speaks of in securing the occlusion, I do not allow the patient to bite down into the wax, but just to touch the wax and then open, when I remove the wax which prevents the closing, and so on, a little at a time, until occlusion is perfected. Never at any time until the occlusal carving is completed do I allow the patient to bring the teeth firmly together. However, as said before, I prefer the indirect-direct method.

Let me go through the technique briefly. The cavity is prepared and an impression taken (I use Lockhead's in-

lay impression material), this impression is removed, and packed with amalgam. When the amalgam has hardened the resultant model is removed from the impression, and a wax pattern made in it, contoured, and carved. It is now tried in the tooth and the final occluding is done; the margins can be burnished if necessary. The pattern is then removed, washed, and invested.

In using the indirect-direct method it is not necessary to chill the wax. Chilling or cooling the wax to remove it from the cavity when using the direct method is the cause of most of our shrinkage in finished inlays.

The expanded pattern method which Dr. Van Horn introduced I have not found necessary. I tested this method a number of years ago, and got inlays so much larger than the cavity that they would not go in, and had to be reduced in size by placing them in aqua regia.

I have always believed that most of the shrinkage and distortion we get in the finished inlay is due to the shrinkage and distortion in the wax pattern, and that shrinkage and distortion is due to the cooling or chilling which is necessary to enable the operator to remove the wax pattern from the tooth when the direct method is used. When the liquid wax is painted on the wax tray and placed in the tooth cavity it must cool, and in cooling it contracts. We all know the tendency of wax to resume its former shape, and that is just what happens, and we get shrinkage. Dr. Van Horn admits that the wax expands when heated and contracts when cooled—that that is why he has presented this most ingenious method to overcome it; but is it necessary to resort to it if we do not cause the wax to shrink?

Numbers of writers state that the shrinkage in pure gold is so slight that it is not necessary to seriously consider it. Dr. M. L. Ward, in an article published in the DENTAL COSMOS for September 1909, gives the shrinkage of gold in pieces $\frac{1}{4}$ inch in diameter at 0.0008. With copper as an alloy the shrinkage is reduced, so that we need hardly take the gold shrinkage into consideration. Dr.

J. G. Lane, in an article published in the *Dental Digest* 1911 on "Investments for Casting Molds," shows by experiments that investment materials can be and are made that will not shrink.

In prosthetic work casting is resorted to extensively. In bridge work I use it exclusively in making telescoping crowns, and in casting cusps and contours on crowns. In porcelain crowns I use the casting method, also in all dummy or pontic work (and these are cast in one piece), saddles, and cast clasps. I never even think of shrinkage in doing this work, and it does not bother me. If we got shrinkage telescoping crowns would not fit. I use the all-porcelain crown in my bridge work so that the tooth has to sit inside the casting, and if we had any considerable shrinkage the crown or tooth would not go to place; and so with the other work I have mentioned. I believe this is all due to using the wax at a workable temperature, never cooling or chilling it. When my pattern is made I invest it, and allow about ten minutes for the investment to set. I then place it on a Bunsen burner with the flame turned low for five minutes; then turn the flame on full. For an inlay of average size it generally takes from ten to twelve minutes to heat up the investment; larger pieces accordingly. I cast in a hot mold, using a steam-pressure machine. The pressure must be maintained from one to two minutes according to the size of the casting and the gold alloy used. With pure gold the pressure has to be maintained the longest; by removing the pressure too soon the excess ball of gold will chill first, and draw the other gold to it, causing a rounding of the corners and imperfect margins. The flask must be allowed to cool before the casting is removed.

I have tested casting in hot and cold molds by making two rings on a tapering mandrel, one cast in a hot mold and the other in a cold one, the investing material used for both being from the same mix. The ring cast in the hot mold drops to the bottom of the mandrel, and the one cast in the cold mold stops about

three-eighths of an inch from the bottom. That is why I prefer the hot mold or flask to cast in. Not only the wax and gold, but everything that we use or do in casting must be considered—preparation of cavity, accessibility, wax, making of pattern, withdrawal of pattern from cavity, investing material, investment, setting of the investment, drying and heating, gold, melting of gold, casting apparatus, actual casting, cooling of the flask and contents, cleaning of the casting, fitting the casting and polishing it, cementation, and the final polishing. Care must be taken in cementation, as the most perfect-fitting inlay may be spoiled by not being seated properly.

Dr. E. Carlton Palmer. As far as the producing of a wax model of an accurate size corresponding to the cavity is concerned, I think Dr. Van Horn can probably make as perfect a wax model by his method as one could desire; but after several years of enthusiasm regarding the gold inlay—the gold castings for fillings—I must say that I am rapidly reaching the stage in my practice where I am doing as little of it as I can.

With regard to producing a wax pattern, as I have said, all the accuracy you could ask has been accomplished in this method. I much prefer the direct to the indirect method, because every time we take an impression and from that take another one, we multiply the chances of error; but there are many other things to be considered. For instance, very few men use the same investing material, and there is a difference in the contraction and the expansion under heat of these materials. Then very few use the same impression wax. I presume that under this method you could, with almost any wax, by using a liquid wax in addition to the ordinary casting wax, get a uniform result; but in many of these fillings put in by others and by myself I have noticed that the deficiency almost always occurs at the vulnerable point, the cervical margin; the failure almost always occurs there. I have used many inlays for retention of the ends of bridges. I notice that Dr. Peeso has lately said that the cast-

ing is almost useless for making these attachments, and he advocates, and I have used for a long while, a method that suits me much better than the absolutely entire casting. I like to take very thin pure gold, No. 40 or 42 gage, and burnish that in my cavity first, the same as we burnish our platinum for making porcelain inlays; and then use whatever good casting wax I desire for making my wax mold inside that matrix. I trim the matrix, leaving an overlap on all margins of the cavity. Then I cast against that gold matrix. I do not run the wax over the overlap with my gold, and the result is that when I have my casting, I have a filling with an edge that I can burnish. I have never seen a gold casting with a gold cast edge that I could burnish. I get better cervical margins in this way, and much more satisfaction.

Dr. Norman S. Essig. I am very much interested in gold inlays, and in this discussion, because it proves conclusively to me that the basic principle of all our dental operations is accuracy. And unless we start with that fundamental, operating by an absolutely accurate method, our results will not be advantageous. In other words, in prosthetic dentistry—and I cannot help drawing my simile from that particular angle—we cannot expect anything in the way of accuracy or success unless our model and impression and our preliminary technique are absolutely accurate. Therefore I do not believe that in any other department of dentistry we can arrive at good results unless our basic steps are equally accurate.

It occurs to me that in the discussions tonight almost all the methods described are arrived at from approximately the same angle. Dr. Robinson's remarks indicated that he had obtained his results empirically, but along almost identical lines with those employed by Dr. Van Horn. These conditions are similar to those which obtained in earlier days in the filling of root-canals. We had many men who accomplished this particularly difficult operation in a perfectly satisfactory manner. I have a

collection of radiographs which show clearly that some of the results that were obtained long before the present method was adopted and was in general use were perfectly satisfactory. Afterward it was deemed best to resort to other and more scientific means, but, after all, this whole subject of success harks back to the question of accuracy. Whether a man arrives at a great degree of precision through his long experience, or by what we now deem entirely empirical methods, or by employing strictly scientific methods, the results are one and the same. Dr. Robinson has attained his results along lines similar to those employed by Dr. Van Horn, which are more accurate and scientific, and in logical sequence. So I feel that this whole question of accuracy in dentistry depends entirely upon precision in the fundamental steps. Personally, I am in favor of the more accurate methods.

Dr. R. E. Denney. I merely want to mention something which has made a great improvement in my gold castings. I found that every once in a while I had an inlay that was rough and difficult to seat. Usually my inlays were very fair, but occasionally they were very poor. I endeavor to use the same technique in all cases, and was at a loss to explain this difference in results. It occurred to me that perhaps the investment was at fault. I use Taggart's inlay investment according to directions, but as the investment material is likely to be thinnest at the top, and this thin investment material is usually painted on the model, I felt that this was where the fault lay. I overcame this with blotting paper, blotting out most of the moisture from the investment painted on the model, then adding more investment, and blotting this until the model was well covered with thick investment material, then investing as usual.

The casting which resulted from this method was as good as the best inlay that I had ever cast. This method now is routine practice, and my inlays are far superior to most of those formerly cast.

Dr. Van Horn's plan of wetting the model before investing would naturally weaken the investment immediately in contact with the model, unless the excess moisture were blotted out by some such method as I have described.

I feel that this is a point worth mentioning, and one worthy of your consideration.

Dr. Van Horn (closing the discussion). The discussion has been very generous, and the discussers very kind.

Dr. Guilford is interested in definite temperatures. He is not half as interested as I am, for that has been my one big bugbear—definite temperatures, definite results, or, as Dr. Essig said, accuracy. If you go over my articles in the *DENTAL COSMOS*, you will find that at no time have I claimed absolute accuracy. My meager equipment was such that I could simply lay the foundation, though I believe that this foundation is entirely sound.

If, as Dr. Guilford pointed out, our Scientific Research Institute would supply us with definite information relative to the physical properties of the materials necessary to the casting process, we would then have definite figures, and could proceed logically to definite results. If you refer to the December 1918 issue of the *National Journal*, you will see an article by Dr. Price of Cleveland, on "Root-fillings." He takes up the question (through an assistant, whose name I forget for the moment) of the physical properties of gutta-percha under varying thermal influences and conditions. These experiments are very exhaustive, and seem very definite. What we need, and need badly, is the same thing regarding the casting process.

My very crude equipment for scientific research makes it necessary to impress upon you, as I have always endeavored to impress it upon others, that the expanded pattern technique is scientific only as a basis; and all the figures that have so far been given are more or less approximate. It is to be hoped that our National Research Institute will become interested in the expanded pattern technique, at least to the extent of giving us definite temperatures.

Dr. Robinson uses what he calls the "indirect-direct" method. I am very glad he put the word "direct" there, because if he had not, I should have had to say much more than I am going to say respecting the indirect method, and especially since the ground was partially covered by Dr. Palmer in his remarks relative to the indirect method.

Dr. Robinson tells us that he takes an impression of the cavity, etc., in impression compound. Please bear in mind the fact that impression compounds have a coefficient of expansion and contraction which to all intents and purposes is relatively the same as pattern wax. Assuming that Dr. Robinson is able to obtain a perfect impression of the cavity and immediate surrounding tooth tissue (which is a difficult proposition when you consider that an impression must be withdrawn directly in line with the line of draft, and that any protrusions which obtrude upon the line of draft will distort the impression), he then constructs a model, and in this model constructs a wax pattern, and then fits this model-made pattern to the tooth cavity. Now what has been gained, or lost? As I see it, he has spent much unnecessary time and energy to make a simple wax form. After obtaining his wax form he proceeds very much as I do, except that he does not use liquid wax in his final fitting. He said that the liquid wax must, of necessity, mush out. Certainly it does, in degree. Two things cannot occupy the same space at the same time. However, if Dr. Robinson will adopt and master the wax-tray method, as outlined, I think he will find that the marginal overlap of the wax tray in conjunction with properly laying on the melted wax will give him little concern relative to the mushing-out feature; and further, that he will find that it will give him more perfectly fitting patterns than by any other means.

I do not wish to "teach old dogs new tricks." If a man gets success by his technique, that is the technique for him to use. But do not be deceived. I am inclined to think that we are all more or less prone to deceive ourselves at times. As an illustration: We are

prone to make patterns at room temperature for a cavity in technic teeth, or on a taper mandrel, and we invest these patterns at room temperature, or possibly use warm water. Since the expanded pattern technique was brought out, many operators use warm water for mixing the investing material, and thus are using, in degree, the expanded pattern technique. If you make a pattern at average room temperature (68° to 70° F), mix the investment with warm water, and cast in a red-hot mold, you will get a rather perfectly fitting casting; but if the room temperature happens to be as we had it a few days this past summer, when my laboratory was 90° F., you will notice a decided discrepancy in the fit of this latter casting, especially if the investment be mixed with cold water. If you want to be fair with yourself and your patients you will make patterns at mouth temperature, then make castings according to your favorite technique, and check results. Unless your technique takes cognizance of the physical effect of heat upon the materials used, I fear your results will be similar to those reported by Dr. Palmer.

I have made castings which were much larger than the pattern, and have also made them much smaller. It is simply a question of recognizing and taking advantage of the physical effect of heat. Try this experiment: From two patterns of the same dimensions (which have, preferably, been made at mouth temperature), make castings. Invest No. 1 at 110° F., and with No. 2 mix the investing material with ice-

water and invest it; then note the difference in the size of the two castings. A few such experiments will, I think, convince even the most skeptical, provided, of course, that the patterns be made in accordance with the rules laid down in the present and former articles on the expanded pattern technique. Pattern wax *must* be scientifically manipulated to give definite results.

Dr. Robinson brings up the question of chilling the wax while in the tooth cavity. If he reviews my former articles he will find that non-plastic pattern wax should never be so treated. Under no conditions should it be, nor does it require to be chilled while in the tooth cavity. There is no reason for it, and there is a big scientific reason why it should not be so treated. (See former articles dealing with "elastic properties of stretched wax" and its control or neutralization, DENTAL COSMOS for August and September 1912.)

I hope I have covered everything. Again I want to thank you for your kindness and for the honor that you have conferred upon me.

On motion, the society gave Dr. Van Horn a rising vote of thanks in appreciation of his most able paper.

The death of Dr. D. G. Gairdan was announced by the president. Dr. Guilford moved that a committee be appointed to draft resolutions on the death of Dr. Gairdan. The motion was seconded and carried.

The meeting adjourned at 9.55 P.M.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDWARD C. KIRK, D.D.S., Sc.D., LL.D., *Editor.*

L. PIERCE ANTHONY, D.D.S., *Associate Editor.*

PUBLISHED BY THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Virgin Islands, Cuba, and Mexico. Canada, \$1.40. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the EDITOR, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, MARCH 1919.

EDITORIAL DEPARTMENT

Preventive Dentistry and the Dental Hygienist.

THE inauguration some ten or more years ago and the subsequent prosecution of an intensive educational propaganda of oral hygiene has borne more abundant fruits than the most optimistic would have prophesied when the movement began. The results from this propaganda have come from varied directions and with such unlooked-for rapidity that a condition has developed with which the dental profession is ill prepared to deal.

The primary object of the oral hygiene propaganda, the education of the public to a better appreciation of a healthy oral cavity as a necessity to general bodily health, and incidentally to an appreciation of the dentist as an important factor in the health of the community, has been largely accomplished, and with that

has come the recognition on the part of the medical profession of the importance of dentistry as a part of the great healing art, with the additional responsibilities which such recognition carries—not the least of which has been the onus of many diseases which the medical profession has been unable to account for and which they have all too eagerly attributed to faulty dentistry.

Among the beneficial results that have come to the dental profession from the oral hygiene propaganda has been the recognition accorded to dentistry by the Government in the establishment of the Dental Corps of the army on a similar basis to that of the Medical Corps, and the hearty support of the public in establishing and maintaining dental clinics in various communities for the furtherance of the educational campaign and for the care of the teeth of those who are unable to avail themselves of the services of the private practitioner.

Dentistry in the past has been criticized by the public, and particularly by the medical profession—and, we regret to say, not without justification—for a lack of interest in philanthropy and general public health questions; but it has at last shown its willingness to do its share in this respect by the establishment of free dental clinics in numerous communities throughout the country, and more recently by the services of the Preparedness League in preparing men for entrance into the army. The public has been prompt to recognize the beneficial results of such work, and in every community where dental clinics have been established the municipalities have, as soon as the benefits of public dental clinics have been shown, responded liberally in support of the clinics as permanent community institutions. In two notable instances the value of such clinics has attracted the attention of philanthropists and public dental dispensaries have been founded by private endowment—in Boston, through the generosity of the Forsyth brothers, and in Rochester, through the generosity of Mr. George Eastman.

All these efforts, however, have been directed to the philanthropic aspect of the question, namely, the care of the teeth of the poor; and while much good has and will come from these efforts, but little attention has been given to providing dentistry for the so-called middle classes.

Collateral with this educational enlightenment of the public and the medical profession, which has resulted in a demand for a

higher standard of dentistry, has been the educational development within the profession itself. While the dental profession has endeavored to meet the demand for a higher standard of dentistry, it has not made provision for meeting the demand for the larger amount of dental service called for as the result of the oral hygiene propaganda. To meet the demand for better dentistry, not only have the educational standards been raised, resulting in an inevitable proportionate decrease in the number of students entering the profession, but there has been a decided tendency within the profession to specialize in various branches in the belief and hope that more efficient service may be rendered in each branch.

These two educational developments have resulted in not only making dentistry more expensive, but lessening the sum total of dentistry available to the public. It has indeed, as Dr. M. L. Rhein once said, placed high-class dentistry in the category of luxuries which only the well-to-do can afford, and as a result thereof the dental profession finds itself in the anomalous position of educating the public to the necessity of better dentistry and at the same time placing it beyond their reach. The majority of dentists today are busily engaged in looking after the immediate reparative needs of their patients, with little time to devote to the preventive aspect of dental service—*i.e.* the maintaining of their mouths in a cleanly condition after he has once established healthful surroundings. He is therefore face to face with the necessity of either neglecting this phase of his practice or limiting definitely the number of patients who receive his services, and thus proportionately lessening his value to the community.

How, then, are we to meet the situation which we have been mainly instrumental in creating, and how are we to give to the greatest number the benefits of preventive dentistry so urgently demanded by the medical profession? We believe the solution of the problem lies in the direction of the dental hygienist. While the dental hygienist may not be the complete solution of the problem, she will go far in helping the dental profession to meet an embarrassing situation in a highly satisfactory manner. The profession generally has not availed itself of the aid which may be derived from the ministrations of the dental hygienist, mainly because of the objection which has been raised that this assistant

might abuse her privileges and overstep her limitations to the extent of "practicing dentistry."

That phase of the question is purely legislative, and one which we can safely leave to our legislative minds for attention. The main question at issue is that we have created a demand which we cannot adequately meet under existing conditions. The problem has resolved itself into an economical rather than a professional one, and our duty to the community demands that we take steps to meet the condition in a manner creditable to the dental profession and to the best interests of the greatest number of the community.

Fortunately, an analogy to what we may reasonably expect from the dental hygienist in dentistry exists today in the relation which the trained nurse bears to the medical profession. We do not believe anyone would venture the assertion that the trained nurse has abused the privileges bestowed upon her by the medical profession; on the contrary, she has abundantly justified the confidence reposed in her, and we feel reasonably sure that the dentally trained nurse, or dental hygienist, will prove to be as useful an adjunct to the practice of preventive dentistry as the trained nurse is to the practice of medicine.

Dr. Guy S. Millberry of San Francisco, Dean of the University of California College of Dentistry, in urging the legalizing of the dental hygienist in California, says, "Ethically trained dental nurses will be far more likely to conform to their limitations than dentists." If California, after its trying and painful experience with "painless" dentists, does not hesitate to legalize the dental nurse, then we see no occasion for any other state to feel alarmed over the legal aspect of the question. However that may be, we feel confident that our educational institutions can be depended upon to so teach the dental nurse that she will be ethically dependable.

Dr. A. C. Fones of Bridgeport, Connecticut, has given serious thought to the educational aspect of the dental hygienist, and to him much credit is due for inducting into the ranks of the hygienists a most capable and intelligent class of women imbued with the highest ideals and ethical conceptions. As long as the ethical and technical education of dental hygienists is carried on in the manner begun by Dr. Fones we need have no apprehension of

dental hygienists overstepping the limitations of their field of activity.

Massachusetts, Connecticut, and New York States have legalized the dental nurse, and have adopted laws which clearly define the limitations of her sphere, and now California is about to follow the lead of these other states. New York has not only legalized the dental nurse, but has established two schools where they may be trained, and we feel confident that the law of New York, as well as of the other states mentioned, and the provision for its enforcement, are such that this activity can easily be kept under definite control in those states, and we know of no reason why similar laws should not be equally effective in others.

The employment of the dental hygienist in the public school clinics—a work for which these women seem eminently and particularly well fitted—of Bridgeport, under the supervision of Dr. Fones, the pioneer effort of this character, is now in its fourth year, and the benefits derived from it have been recognized by the city council to such an extent that each year has seen an increase both in the corps of hygienists employed in the schools and in the annual appropriation from the city for this service. Dr. Fones has just presented a report on his work at the end of the fourth year, and, while he makes no sensational claims, it is plainly evident to all who are conversant with the results of this experiment in oral hygiene that as an economic measure its benefits to the community have been of inestimable value.

Preventive dentistry is a present need demanding immediate attention, and as the dental hygienist has long since passed out of the experimental stage, and definitely proven her usefulness, the dental profession cannot afford longer to evade the issue.

The medical profession is making serious demands on us to “clean house” and eliminate the oral cavity as a prevalent source of systemic infection, and the dental hygienist can materially aid us in this much-needed house-cleaning.

The hope of the future in dentistry, as well as medicine, is prevention—and the hope of prevention of dental diseases to any considerable degree in the future lies in oral prophylaxis systematically and persistently prosecuted.

The "Journal of the Allied Dental Societies" Ceases Publication.

THE *Journal of the Allied Dental Societies* announces that with its December 1918 issue it will conclude its separate and independent career, and that it will be merged with and succeeded by the *Journal of Dental Research*.

The *Journal of Dental Research*, "a new journal devoted to the promotion and publication of dental research, and to the correlation of published investigations in dentistry and related arts and sciences," will be published quarterly under the editorial supervision of William J. Gies, its first issue being announced for March 1919.

The *Journal of Dental Research* is a new departure in dental journalism, one which we shall watch with much interest and with every wish for its success.

REVIEW OF CURRENT DENTAL LITERATURE

[*Lancet*, London, December 7, 1918.]

The Influence of Diet on Teeth Formation. BY MAY MELLANBY.

There are two objects to this investigation, (1) the factors involved in the development of sound teeth and the growth of the jaws in relation to the size of the teeth, and (2) the factors bearing on the immunity of erupted teeth to dental caries and other diseases. In the present contribution, which is only a preliminary report, the author describes experimental work which deals with the first of the above problems. The data are interpreted to show that (1) hypoplasia of the teeth is caused largely by a deficient diet, (2) the factor in the diet which controls the calcification of the teeth is something of the nature of an accessory food factor (vitamin), and (3) this factor has a similar dis-

tribution to that of fat-soluble A, and has been recently shown to be largely responsible for the calcification of bone, a deficiency of this substance in the diet being followed by the development of rhachitis.

The work was done on puppies, whose diets consisted chiefly of white bread and separated milk, about 200 cc. per diem, together with the substances to be tested. (For details of the diets, see *Journal of Physiology*, January 1918.) In examining the jaws and teeth attention has been paid to the study of (1) the time of shedding the deciduous teeth, (2) the time of eruption of the permanent dentition, (3) the arrangement of the teeth in the jaws, (4) the condition of the enamel, and (5) the calcium content of the teeth.

The experimental work and observations so far made are summarized as follows:

(1) A diet containing in abundance those

articles with which the fat-soluble A accessory food factor is associated—*e.g.* cod-liver oil, butter, etc.—allows the development in puppies of sound teeth.

(2) A diet otherwise adequate but deficient in the substances with which fat-soluble A is associated brings about the following defects in puppies' teeth—(a) delayed loss of deciduous teeth; (b) delayed eruption of the permanent dentition (in some cases the delay in the eruption of the permanent teeth is more marked than the delay in the loss of the deciduous teeth), (c) irregularity in position and overlapping, especially of the incisors; (d) partial absence of or very defective enamel; (e) low calcium content—the deficiency in calcium salts may result in the teeth being so soft that they can be cut with a scalpel.

(3) The evidence makes it clear that this is an instance of diet affecting teeth from the inside, and is independent of bacterial sepsis and other oral conditions associated with food.

(4) These results cannot be considered as being due to acute illness or "malnutrition," for (a) the improvement to the teeth by the addition of fat-soluble A containing substances (animal fats, etc.) is as characteristic as the deleterious result of a deficient diet; (b) there is evidence that the defective teeth are most pronounced in the rapidly growing puppies, and it is difficult to associate rapid growth with illness or "malnutrition," as generally understood.

(5) This work puts the close relationship between hypoplastic teeth and rachitis on an experimental basis.

[*International Journal of Orthodontia*, St. Louis, April 1917 and November 1918.]

(a) Band and Lingual Arch Technique.

(b) The Removable Lingual Arch as an Appliance for the Treatment of Malocclusion of the Teeth. BY JOHN V. MERSHON.

In the November number of the above journal, Dewey devotes the major editorial to an evaluation of Mershon's appliance. The general conclusion is—"We believe there is no appliance which will produce tooth movement as easily and with as little inconvenience to the patient as the properly constructed lin-

gual alignment wire with the correct auxiliary springs."

To appreciate the significance of the lingual arch, it is necessary to realize the underlying principles of the modern school of orthodontia. The note is struck in the first sentence of Mershon's second article: "It is a well-known biological fact that to have normal development of the tissues and organs of the body we must have normal function of these tissues and organs during the process of development." To be specific, "The directions of normal growth of the teeth and facial bone are forward, outward, and downward in the upper jaw; forward, outward, and upward in the lower jaw. The appliance in which the application of force is in these directions and which does not interfere with any of the associated functional forces would be the ideal appliance. I am going to ask your consideration of the removable lingual arch as the appliance which seems to possess many of these qualities. . . . The appliance develops a force which operates from the lingual side, and is in the direction of normal growth, and the muscles of the lips and cheeks are left free to functionate normally."

The removable lingual arch is a wire of suitable size (0.036 in. or 19 gage B. & S.), to which springs can be attached, adapted to the linguo-gingival surfaces of the teeth, and bent to conform to all the inequalities of the dental arch. It is fastened to the lingual surfaces of the molar bands by means of a modified (a half-round tube is used in place of the elliptical one) Young-Angle lock. In the first paper is described the manner of making the molar bands.

A modeling-compound impression of the lateral half of the arch is taken, avoiding distortion as much as possible. The preparation of the model consists in cutting through, with a fine ribbon saw, the surfaces of the teeth on the mesial and distal sides of the tooth to be banded, cutting some distance below the gingival margin of the tooth. A wire measurement of the tooth is taken, as in crown work, taking care that everything be done which will have a tendency to make the band slightly smaller than the natural tooth. The wire measure is cut, straightened out, and laid on a piece of band material (iridio-platinum, clasp metal, or Neyora elastic gold, 0.005 inch thick and 0.18 inch

wide). The band is cut about 0.06 inch longer than the measure, with ends slanting. The band is soldered by this much overlap. The band is contoured and stretched to slip gingivally past the greatest circumference of the tooth, and festooned mesially and distally for the interdental gingival pad. In placing these bands on the teeth the soldered side is placed buccally on the mandibular molar, and lingually on the maxillary. The half-round tube (about 0.1 inch long) is soldered vertically on the lingual side of the band to receive a half-round spur, soldered to the lingual arch. In attaching a tube on the lingual surface of the maxillary molar band it must be placed as far gingivally as possible to avoid interference with occlusion when the lingual arch is in position. The tube on the lingual side of the mandibular molar, providing the molar teeth have the proper buccolingual relation, can be placed nearer the occlusal surface. The bands and the attached tubes are then placed on a plaster model for the preparation of the lingual wire.

This can be made in two ways: In the first paper it is described as being made in three distinct sections, two premolar sections, and a central or incisal section, which are accurately adapted to the lingual contours of the teeth at the gingival line. These three sections are then soldered into one piece. Each premolar section is allowed to extend distally of the half-round tube for a distance of about 1/8 inch to provide for the possible necessity of lengthening the lingual wire toward the conclusion of the treatment. To each premolar section exactly at the point of the half-round tube on the band is soldered a half-round spur, about 0.01 inch shorter than the tube, to allow for the lock at the gingival end of the tube. The object of making the lingual arch in three sections is that the individual sections can be more easily fitted and the ends better adapted than when an attempt is made to fit the entire arch into all the irregularities, and bring the right and left ends to the proper molar positions and get the proper alignment of the spurs without having a spring or "kick" somewhere in the lingual arch. However, in the second paper the method described is to make the arch in one piece.

The arch when first put on is passive. The patient should be allowed to wear it long

enough—usually a week—to become thoroughly accustomed to it. The force necessary to produce tooth movement is obtained in three ways—(1) by straightening out the inequalities in the arch wire, (2) by auxiliary springs soldered to the main arch, and (3) by stretching the wire by means of wire-stretching pliers. It is highly important to take the measurement across from one spur to the other (*e.g.* with the Hawley calipers) immediately on removing the arch from the mouth. The calipers act as a guide in determining how much the perpendicular spurs have been moved either in a buccal or lingual direction. By using such measurements it is possible to place the half-round spurs back in the half-round tube with the same amount of spring as was present when they were taken out, if it be desired. If it be desired to place an expansive force on the molars, the exact amount of expansion which is produced can be checked up by referring to the measurement, as shown by the calipers, which was obtained when the lingual arch was taken out of the tubes. If it be desired to rotate the molars or other anchor tooth, this rotation can also be accomplished by changing the position which the spur bears to the tube by bending the arch in the premolar region. With the perpendicular tube it is also possible to tip the molars in any direction desired or to produce a bodily movement.

The auxiliary springs are wires (0.022 inch in diameter) usually soldered to the gingival side and at right angles to the main arch, and are then bent in the direction in which it is desired to apply force. They are to produce individual tooth movement. For example, they may be used for rotations, to open space for impacted or missing teeth, to move the incisors labially, etc.

Mershon has very rarely found it necessary to band any other than the anchor teeth, either to keep the arch in position or to facilitate the application of force to any given tooth.

One very interesting feature of the lingual arch is that in moving teeth, tipping of the teeth is seldom encountered, unless the work has been hurried faster than normal development. The reason the teeth do not tip is probably due to the fact that the arch occupies a position lingual to the teeth at the gingiva, pressing forward or outward or both,

with the lips and cheek muscles left free to functionate normally, and every contraction of these muscles causes pressure on the incisal edges.

No special retaining appliance is necessary; the lingual arch performs that function from the beginning.

The lingual arch has much to recommend it. It is simple in construction, mechanically and physiologically efficient, inconspicuous, does not interfere with speech, and can easily be kept clean; it allows full play to the buccinator and the muscles of the orbicularis oris group, and leaves all the teeth, except the two anchor teeth, free to functionate normally—in other words, every tooth is left free to receive the normal occlusal impact during mastication, with consequent normal functional bone development, causing the teeth to be carried forward bodily.

[*Annals of Surgery*, Philadelphia, August 1918.]

Clinical Observations Concerning Malignant Tumors of the Jaws. BY A. J. OCHSNER.

This is a clinical review of one hundred consecutive cases operated on by Ochsner at the Augustan Hospital, Chicago, Ill. Practically all of them had been previously operated, and none of them had been operated during the early part of their illness by the use of actual cautery. This was used by the author in every case, in a most vigorous manner. He would emphasize the value of ordinary soldering irons heated in a gas flame to redness for cauterizing these tumors.

Of these one hundred cases, 67 per cent. were carcinomata, the majority of which were in the upper jaw; 16 per cent. were epulides; 16 per cent. were sarcomata, and there was one chondrosarcoma.

In reviewing the predisposing factors in connection with the origin of these neoplasms, it seems that the teeth play the leading rôle (dental caries, loose teeth, crown and bridge work). Irritation seemed to be the second most common exciting cause. Ochsner includes among such irritants "protruding" premolars and molars.

From his conclusions the following are chosen as being of closer dental interest:

(1) Malignant growths seem slower in making metastases in the jaws than in many

other parts of the body. This is especially true of distant and general metastases.

(2) Metastases occur more frequently and at an earlier stage of the disease when carcinoma is located in the lower than when localized in the upper jaw.

(3) The mortality in primary early operation is almost *nil*. In late operations and in secondary operations the results are, however, exceedingly unfavorable.

(5) Malignant tumors of the jaw are much less likely to recur when removed with actual cautery than when removed with the knife, although the latter operation may have been carried out with the same degree of thoroughness.

(8) The histological appearance of epulis indicates greater malignancy with each successive removal. If removed thoroughly with actual cautery during the first operation this tumor does not recur.

(9) Cases that have had teeth extracted and partial operations performed by dentists before coming under Ochsner's observation have almost invariably died from inoperable metastases within two years following the original interference, especially in carcinoma of the lower jaw.

(11) Malignant ulcers having their origin in the embryonic tooth-matrix or in the surrounding mucosa which have invaded the bone can still be treated successfully with cautery, care being taken to keep the cautery iron in contact with the bone long enough to destroy the deep tissues.

(12) Malignant polypi of the antrum may become infected, producing empyema, thus causing the surgeon to overlook the malignancy, and resulting in fatal delay.

(13) Carcinomatous ulcers of the gums are frequently mistaken for benign, tuberculous, or gummatous ulcers, and occasionally for actinomycosis, and *vice versa*.

[*Boston Medical and Surgical Journal*, September 19, 1918.]

Treatment of Essential Facial Neuralgia by Local Alcoholization. BY J. A. SICARD.

This is little more than a translation from the *Presse Médicale*, Paris, 1917. In the vast majority of cases, Sicard performs under local anesthesia, novocain or stovain (1 per cent. *i.e.* 0.5 cgm. of either per cc.). He has abandoned the use of adrenalin because of edema

and necrosis subsequent to its use. The author prefers an all-glass syringe and platinum needle of small caliber, from 3 to 6 cm. long. The quantity of alcohol, of 70 per cent. to 95 per cent. strength, injected should not exceed 1.5 cc. By this means Sicard would destroy the branches of the fifth nerve.

To avoid ocular paralysis, one should wait, after injecting cocaine into foramen rotundum or ovale, four or five minutes before making the alcohol injection. Should the anesthetic come in contact with the dangerous zone of the ocular nerves there will be diplopia, in presence of which the needle is withdrawn. Cocaine diplopia, however, is very transient. For the details of the actual injection the original must be consulted.

This intervention is limited to cases of true facial neuralgia of the so-called "essential" variety: (1) Whenever pain in facial neuralgia persists continuously with no distinct intervals of relief it is not a case of essential neuralgia. (2) Cases of facial neuralgia which, not having been already treated surgically or by local injections, are accompanied by cutaneous or mucous anesthesia, are not cases of essential neuralgia. (3) When facial neuralgia, previous to any intervention, presents associated signs of stimulation or paralysis of other cranial nerves, *e.g.* trismus, diplopia, facial paralysis, lingual hemiatrophy, etc.—it is not a case of so-called essential neuralgia. (4) A case of facial neuralgia which *ab initio* involves the three branches of the fifth nerve is not a case of essential neuralgia. In these cases secondary facial neuralgia is of either exo- or endocranial origin—*e.g.* syphilis, tuberculosis, cancer, abscess, sinusitis, etc. In these the injections of alcohol, far from affording relief, on the contrary aggravate matters; nor is it of service in neuralgia following herpes zoster of the trifacial, for this is not a peripheral lesion.

To Sicard the results are remarkable in all cases of true essential facial neuralgia. Success is certain when the alcohol has really destroyed the branches or nerve trunks responsible for the pain. Out of several hundred patients, there were only two in which there was not alleviation after observance of regional anesthesia (the criterion of the alcohol having reached the desired nerve). Of these several hundred cases, twenty-two remained cured for from ten to fourteen years. As a rule relapses occur in a year or eighteen

months. After the fifth or sixth injection, however, it is rare for the cure not to be permanent.

[*Journal of Experimental Medicine*, December 1, 1918.]

Relative Irritant Properties of the Chlorin Group of Antiseptics. BY GLENN E. CULLEN AND HERBERT D. TAYLOR.

This experimental work was performed on the ears of rabbits. The solutions employed were eight hypochlorite solutions prepared by different methods, a eusol solution, a carbonate control with a hydrogen-ion concentration of 9, chloramin-T, and dichloramin-T. The reactions are given in terms of the hydrogen-ion (pH) concentration. The authors summarize their study as follows:

Sodium hypochlorite 0.5 per cent. solutions have minimum irritant effects over a range of alkalinity of from about 100 to 1000 times that of water (pH about 9 to 10). Such solutions kept within the above range of alkalinity by either borate or carbonate buffer salts, *i.e.* Dakin's solution, show the same irritative properties whether made from bleaching powder and sodium carbonate or from chlorin and sodium carbonate. Electrically prepared solutions of the same concentration have a similar irritant effect. However, solutions that have an alkalinity less than pH of 8.5 to 8.8 or greater than pH 10.2 are intensely irritating.

Sodium hypochlorite 0.5 per cent. solution from which most of the calcium has been precipitated and calcium hypochlorite solution of equivalent hypochlorite content are only slightly irritating.

Chloramin-T 2 per cent. solution has no irritant action.

Dichloramin-T 5 per cent. in chlorococaine and chlorococaine alone exert only a slight irritant action upon rabbits' ears. This is of particular interest, because the strength of dichloramin-T used in root-canal sterilization, usually without irritation (see Prinz, *DENTAL COSMOS*, December 1918), is 5 per cent.

[*International Journal of Surgery*, January 1919.]

Pyemia as a Sequel to Mandibular Fracture Due to Tooth Extraction. BY J. A. HOFHEIMER.

Aside from its rarity, this case is of interest because the author has been able to keep

track of the patient throughout a period of sixteen years which are extremely important ones in masticatory and facial development.

Case. Boy, age nine. The right mandibular first molar was extracted by a "painless" dentist. At this operation the mandible was fractured. Marked local infection was apparent in a few hours, shortly followed by systemic symptoms—fever, chills, prostration, anorexia, weak pulse, and albuminous urine. Within two weeks, the right leg from hip to knee was involved in a severe suppurative process. Operative interference and drainage put this lesion under control. Ten days later an abscess was recognized beneath the scapula, burrowing in a downward and forward direction along the ribs. One month after the operation on the thigh an abscess was discovered in the left gluteal region (an ischial abscess). After this third operation the temperature dropped to normal, and the control of infection seemed accomplished.

Attention was then turned to the jaw injury. The right ascending ramus had become necrosed almost to its articular extremity. Under general anesthesia the gum was incised in the median line up to the articulation. The soft parts were pushed back from the bone. The whole ascending ramus and that portion of the body distal to about the premaxillary region were removed.

The result was eminently satisfactory. The initial marked deviation of the chin toward the left was partly controlled by bandaging and later by exercise. As new bone was formed, this deformity gradually grew less. When the patient was examined one year after the injury, a slight lateral deviation to the left of the chin was noted, but there was a decided bony formation throughout the whole area from which the removal was made. Nine years after the injury the bone formation of the jaw was in such good shape that he could wear an artificial denture to fill the space left void by the lost molars. The contour of the face was improved. Fourteen years after the injury no deviation of the jaw was noticeable.

[*Surgery, Gynecology, and Obstetrics*,
November 1918.]

Studies in Paleopathology. By R. L. MOODIE.

In his Fig. 6, Moodie shows a maxilla of an Egyptian (Coptic, 400–500 A.D.), manifesting

the effects of dental caries and necrosis of the palatum durum. In Fig. 7 there is shown the mandible of an Egyptian (Coptic, 400–500 A.D.), with effects of dental caries and pyorrhea. Both of these specimens are after Ruffer. Moodie also refers to an instance (Kieth, "Antiquity of Man," 1916) where there had been loss of a tooth not from dental caries but from an abscess (it is not at all clear that Kieth really refers to a hematogenic apical abscess), in a paleolithic Englishman who lived about 40,000 years ago.

In the cave bear of the Pleistocene, Walther (*Graefe's J. d. Chir. u. Augenheilk.*, 1825, viii, 1–16) describes caries of the left mandibular ramus, especially extensive in the alveolar fossæ and processes of the canine and molar teeth, resulting in extensive absorption of the processes similar to the modern results of alveolar pyorrhea.

Fig. 41 shows dental caries in a mandibular molar of a three-toed horse (*Merychippus campestris* of the Miocene of Nebraska). In 1886 Joseph Leidy called attention to caries in the mastodon. The supposed caries appears as an irregular excavation immediately above the crown of a tooth, about 0.5 inch deep, the surface of which appeared to be irregularly eroded.

Dental caries has been further mentioned in Permian fishes (Renault), who ascribes the results to several types of bacteria. Dollo has referred to an example of dental caries in one of the mandibular teeth of a Mosasaur (a large Cretaceous reptile).

[*Journal of the American Medical Association*,
October 19, 1918.]

Roentgenographic Studies of Tissues Involved in Chronic Mouth Infections. By ARTHUR D. BLACK.

This is a continuation of a previous report (DENTAL COSMOS, October 1917, p. 1040). The present tabulation, which includes that of last year, covers 600 roentgenographic mouth examinations, for each of which 10 small films were made—a total of 6000 films. The results of this larger study very closely parallel the previous figures. It is very interesting to note that last year's tabulation of 300 persons showed 59 per cent. with alveolar abscess, while for 300 added this year only 41 per cent. had alveolar abscess. It is believed that this difference represents in some measure the better realization of the danger

of these infections to health, with the result that a larger number of infected teeth have been extracted.

Of the 600 adults examined, 78 per cent. are shown by the roentgenograms to have definite areas of bone destruction about the teeth. This high percentage is interesting in connection with the frequency of systemic conditions in these same patients. No history was available for 99. Of the remaining 501, 363 are reported as entirely negative as to secondary systemic disorders; 72 complained of occasional muscular or joint symptoms, and 66 reported well-defined cases of arthritis, nephritis, appendicitis, etc. (This group of 66 is for various reasons as pointed out by Black not representative of the entire adult population.)

It is not apparent from this paper whether or not the number or apparent extent of oral infections per individual were lower in the 363 persons in whom no secondary symptoms were reported than in the 138 patients manifesting such symptoms. Also within this last group, an interesting question would be whether or not the group of 66 with well-marked symptoms exhibited individually quantitatively or qualitatively more oral infection than did the 72 in whom the symptoms were mild and ill defined.

The percentage of abscesses (apical rarefactions subsequent to death of the pulp) for all root-fillings was 45 (these closely agree with last year's results); for good root-fillings 9, for poor root-fillings 63. To Black it seems that no better argument could be found to induce dentists to be more painstaking in their root-filling technique, for here is the opportunity to reduce the total of alveolar abscesses to about one-fifth of the present number. These figures are not close to those presented by T. P. Hyatt, in a somewhat similar study (*Dental Items of Interest*, July 1918, p. 525). A calculation from Hyatt's figures showed apical rarefaction in slightly over 40 per cent. of all root-fillings, in slightly over 25 per cent. for good root-fillings, and in slightly over 41 per cent. for poor root-fillings.

The effect of the study of these cases is well shown by the changes that have been noted in the clinic of the Northwestern University Dental School. During the past year nearly 24,000 teeth were extracted, and the number

of artificial crowns and bridges much reduced, while there has been a corresponding increase in the number of artificial dentures made for patients. This is an expression of the changes in dental practice throughout the country. A constantly increasing number of dentists are coming to realize that it is their positive duty to free the mouths of patients from infection, even though this requires the extraction of a number of teeth. But what is of much more importance, there is a determined effort on the part of many to use every possible means of *preventing* the occurrence of these chronic mouth infections.

In the discussion of this paper, the central thought seemed to be the view enunciated by Zentler, that lack of absorption in the roentgenogram does not indicate sterility, nor does the presence of absorption indicate infection at the end or around the root of the tooth.

[Journal of the American Medical Association, October 26, 1918.]

Cancer of the Oral Cavity, Jaws, and Throat. Treatment by Electrothermic Methods or in Combination with Surgery, the Roentgen Ray, and Radium, with an Analysis of 200 Cases So Treated. BY WILLIAM L. CLARK.

[Pennsylvania Medical Journal, June 1918.]

Treatment of Malignancy in the Mouth and Throat by Radium. BY RUSSEL H. BOGGS.

[American Journal of Surgery, January 1919.]

Diagnosis and Treatment of Basal Cell Epithelioma. BY BERNARD F. SCHREINER. BURTON T. SIMPSON. AND THEODOR MUELLER.

The volume of the evidence submitted by Clark and its careful analysis demand respect and serious attention. The dental aspects of malignancy are forcibly emphasized. The great majority of persons suffering from such lesions within the mouth have all their lives been unsanitary or careless in the care of their mouths and teeth. Indifferent dental work or rough teeth causing continual irritation has been found to be a predisposing cause in many cases of mouth cancer, for the disease begins exactly at the site of the area which has been subject to a continual irritation. Permanent bridge work and poorly fitting plates permitting the retention of food

and irritation to the gums are also factors in the development of malignant disease in the mouth. The removable bridge is best, and great care should be taken by dentists in properly fitting and adjusting plates. Leukoplakia, papillomata, angiomas, chronic stomatitis, root abscesses, and fistulae should be appropriately treated as a prophylactic measure against the development of malignant disease. The irritation caused by excessive smoking is a contributory factor to the development of leukoplakia and oral cancer, especially in those who fail to keep their mouth and teeth clean.

A section should never be taken for pathologic examination except immediately before operation. Before treatment in any case of mouth cancer, a careful stereoscopic roentgenographic study should be made to detect possible bone or antrum involvement. Transillumination tests should also be made as a confirmatory diagnostic measure.

The chances of success vary with localization, the anatomic location, and the presence or absence of glandular involvement.

In the same issue of the *Journal*, G. B. New reports on the use of heat and radium in the treatment of the jaws and cheeks. Practically this same report has already been summarized in the *DENTAL COSMOS* for September 1918, p. 831.

Though the clinical material presented in Boggs' article is much narrower than that presented by Clark, still its general trend is quite similar, and the conclusions quite in harmony. Only eleven case histories are briefly included. In the treatment of malignancy of the mouth and throat with radium results have been obtained in a sufficient number of cases to entitle its use to consideration in every case, whether alone in small lesions, as an anti-operative procedure, or as a palliative method in hopelessly inoperable cases. And since even the smallest lesions are very prone to recur locally, and the adjacent glands are so early invaded, radiotherapy should follow surgical removal of even the smallest growth. Persistent lesions in the mouth and throat are nearly always malignant or syphilitic. Superficial cautery seldom removes a malignant lesion, and nearly always hastens metastases. Failure to realize the malignancy of such lesions permits the disease to become far advanced. Caulterization and inert mouthwashes are

worse than useless. The brilliant results which have been obtained have induced some to consider radium as primary treatment. But if good results from this treatment do not follow in a reasonable time, then the advisability of coagulation or operation must be considered.

Roentgenization of the lymphatic nodes should always supplement radium therapy. The object of this is to control and destroy metastases. The nodes should be treated in the early cases, because of the impossibility of excluding invasion of the glands. With the roentgen rays larger areas can be treated, and this method is more practical than radium, when treating the entire cervical chain of lymphatics. But inside the mouth the results of roentgen-rays cannot be compared with those of radium. In short, both radium and roentgen rays will produce a destructive action, but with radium a reaction of much greater intensity can be produced without seriously injuring healthy tissues than with the roentgen rays. In some cases it is advisable to follow radium treatment by electric coagulation. The advantages of electric coagulations are the destruction of tissue without opening the blood and lymph vessels, and the prevention of metastases.

Boggs is convinced that if radium were employed as a routine procedure in early cases, often no other treatment would be necessary, and in advanced cases, when followed by coagulation or operation, better end-results could be obtained. More can be accomplished by raying the adjacent lymphatics than by removing them surgically, because if the glands are palpable, operation seems to hasten rather than to retard the malignant process. Carcinoma of the mouth and throat is not as amenable to radium as is sarcoma.

Brenneman, immediately following Boggs' article, gives a case report of lingual carcinoma which cleared up under radium, only to recur in about two and a half months. However, the recurrence yielded readily to a second course of radium treatment, since which three years have elapsed. A cervical adenitis was present which disappeared under one exposure to the Coolidge tube. Brenneman emphasizes the need of proper regard to the question of dosage and of the patient presenting frequently for examination following treatment.

The article referred to in the third title

above is based on the study of fifty-nine cases. The period of observation of the patients varied between several months and three and a half years. In treatment the following procedures were used: Fulguration, excision, radium, and roentgen rays. Fulguration has only a local effect, which is practically the same as cauterization or coagulation of the tissue. It does not possess any advantage over the thermo-cautery in the treatment of basal-cell epithelioma. Only two cases were treated with fulguration. One of them healed promptly, the other was fulgurated several times, but remained stationary, and healing was at last obtained by radiation.

A comparison of the different methods of treatment gives the following results:

Clinical cures.

Excision	100	per cent.
Radium application	50	" "
X-ray—fractional dosage .	69	" "
“ massive “	97	" "

[*Journal of the American Medical Association*,
December 14, 1918.]

**Treatment of Neuralgia of the Fifth Nerve
by Injection of the Gasserian Ganglion.**

By H. H. MARTIN.

Quite contrary to the opinions of Frazier (DENTAL COSMOS, September 1918) and Hutchinson (DENTAL COSMOS, October 1918) is the belief of Martin that injection of the Gasserian ganglion through the foramen ovale for the relief of trigeminal neuralgia “will eventually supersede surgical extirpation of the ganglion, division of the sensory root, peripheral and nerve trunk injection, and other more or less unsatisfactory methods.” He does not limit the application of this method to Sicard’s “essential” neuralgia. (See p. 249.)

If pain is limited to the area supplied by the third branch only, the injection can to a certain extent be limited to this branch; but if the first or second branches are involved, the needle should be inserted into and through the corpus of the ganglion until the point has penetrated the sensory root. This can be accomplished with a reasonable degree of accuracy. Martin attempts this in every case. The only serious consequence is a neuro-paralytic keratitis, which in his experience occurs in about 30 per cent. of all successful injections, but rarely involves the

deeper layers of the cornea, and in most cases is overcome in due time without injury to the eye.

The technique of the injection is simple in the extreme, but ability to locate and enter the foramen ovale can be acquired only by extensive and patient trials on the cadaver. On the basis of this experience the operator is to visualize mentally the location of the foramen by a study of the contour of the face and head of the patient. For the details of the insertion of the needle reference must be made to the original article. (2 cc. of 95 per cent. alcohol are used.) Seven case histories accompany this report. In all, he has treated nine patients, all but two of which have remained free from pain for four years.

Incidentally, in concluding the discussion Martin mentions that he has tried cocain injections into the ganglion for operating on alveolar abscesses.

[*Journal of the American Medical Association*,
November 16, 1918.]

**Bacterial Toxin as a Cause of Retinal
Hemorrhage.** BY ARTHUR S. TENNER.

The patient was a man of fifty-four, complaining of headache and poor vision. While in apparently the best of health he had become suddenly blind in the right eye. Evidences of constitutional disease were absent; the blood-pressure was relatively low (systolic 110, diastolic, 65). The eye showed a recent pre-retinal hemorrhage, about half as large as the disk, in the region of the macula. The retina was edematous. The vessels showed no arterio-sclerosis. The left eye was normal in every respect.

The nasal sinuses were negative. The mouth contained numerous decayed teeth, and there was a well-marked pyorrhea alveolaris. Five teeth were extracted. From an alveolar pus pocket was secured a pure culture of a non-hemolytic streptococcus, from which a vaccine was made. Eight weeks after the onset, six inoculations having been given, the clot had been completely absorbed and the vision was 20/20.

Although pre-retinal hemorrhages are usually absorbed without injuring the retina permanently, the rapid clearing of the retina and absorption of the clot, immediately subsequent to the inoculations, seemed to Tenner rather striking.

[*Journal of Experimental Medicine*, January 1, 1919.]

Action of Chlorinated Antiseptics on Blood-Clot. BY HERBERT D. TAYLOR AND MARIANNE G. STEBBINS.

The solutions used included Dakin's hypochlorite, chloramin-T, and dichloramin-T. Rabbit blood furnished the clot. Careful controls were run with every experiment.

The work in summary demonstrated that the chlorinated antiseptics have no power to penetrate blood-clots and destroy bacteria therein contained. Correspondingly, blood-

clots may protect virulent bacteria for a long time, and the organisms properly planted will proliferate in a normal manner. It seems probable that the fibrin of the blood-clot is the resistant substance, as plasma and red and white cells are easily dissolved by these antiseptics.

In view of the current widespread tendency to determine the dental possibilities of these newer antiseptics, and in view of the rôle of the blood-clot sequent to extraction with curettage, and to root resection, this work is of interest.

PERISCOPE

To Repair a Broken Facing.—If a facing breaks on a bridge do not remove the bridge, but build a new facing with synthetic porcelain.—J. W. CORMANT, *Oral Health*.

Consideration for the Patient.—After removing the rubber dam apply a little tincture of aconite and iodine to the gums. This will serve in a measure to ameliorate that "used-up" feeling of the mouth which so often follows oral manipulations.—*Oral Health*.

To Pass a Strip Through a Tight Contact.—When it is difficult to pass a finishing strip into the interproximal space on account of a tight contact point, sometimes it can be done by first passing a ligature to the tightest point. Then pass the strip down against it and carry both ligature and strip through.—J. F. NELSON, *Oral Health*.

What is "German Silver"?—German silver is a composition of nickel, copper, and zinc in varying proportions. Its value in the arts depends on its color, luster, hardness, tenacity, toughness, malleability, ductility, machining qualities, and resistance to alkalis and acids. Generally speaking, it is manufactured in three ways. The German method is to melt all the copper and two-thirds of the nickel and zinc in a graphite crucible, and then add the rest of the nickel and zinc. In the English method, all the copper, nickel, and zinc are melted at one time, then zinc and copper are added; should a test show that the metal is porous, a

fireclay pipe containing pitch is pushed into the metal to deoxidize it. One American method is to melt a copper-nickel alloy and then gradually add the preheated zinc.

"German silver" is now called nickel silver.—*The Crucible*.

A Case of Antral Abscess Treated with Salicylic Acid.—Antral abscess is often a very troublesome condition, and the following long-standing case in which the treatment adopted proved efficacious in stopping the discharge may prove suggestive.

The patient was an elderly lady, with an abscess of the antrum which had existed for fourteen years. During this time the tube had been removed every night and morning, and the cavity syringed with an antiseptic solution. Guided by the principle that all chronic discharging surfaces should be kept dry, and knowing that salicylic acid is one of the most powerful bactericides we possess, I treated her by plugging the antrum with a piece of gauze into which I had rubbed a powder consisting of salicylic acid one part and sacch. alb. four parts. This was passed loosely into the cavity, and renewed daily. On the fourth day the discharge had ceased. Treatment was then suspended, a piece of cotton being placed over the opening of the sinus, which was kept in position by the denture the patient was wearing.

The treatment was effective. Three months later the patient reported that she had had no further trouble from the day of the last plugging.—PERCY R. WILDE, *Lancet*.

Apothesin Anesthesia.—In removing necrosed bone and treating abscessed cases with the aid of apothesis, I have had less complications than at any time during my experience with local anesthetics.

For adults I use two per cent. solution, and in children one to two per cent. solution, always boiling the solution before using. I have had an extensive experience in extracting for children, and in these cases there has never been a complaint of pain nor any harmful effect observed.

Poor technique is often responsible for poor results in the use of any anesthetic solution. If the best results are always to be obtained it is necessary for the operator to employ a sterile solution, sterile syringe, and sterile needle, using a small needle with a very sharp point. Make the injections slowly, causing as little traumatism as possible.—O. O. CARTER, *Dental Register*.

Anesthesia in the Reduction of Fractures.—It has been the experience of the author that local anesthesia is preferable to general anesthesia in accomplishing reduction of fractures of the jaws. Local anesthesia eliminates the dangers of general anesthesia; it eliminates the probability of the patient's vomiting following the operation, which is of great importance, especially if interdental ligation has been resorted to. It also assures at least a partial co-operation on the part of the patient, which is very desirable when endeavoring to establish natural occlusion.

The so-called conduction anesthesia or nerve blocking is the method of choice in producing local anesthesia. This can be accomplished in one of two ways, viz, the intra-oral method or the extra-oral method.

In many cases of fractures of the jaws, there will be so much traumatism that the intra-oral method of conduction anesthesia will not be practicable, and again, on account of septic conditions of the oral cavity, a perfectly aseptic technique cannot be carried out by this method. These objectionable features are all obviated in following the extra-oral method in producing conduction anesthesia.—CHALMERS J. LYONS, *Dental Summary*.

Position of the Contact Point.—The position of the contact point depends to a very great extent upon the form of the tooth; the form of each surface, its height of contour, the mesial and distal marginal ridges, and the position of the tooth in the arch. To know where to place a contact point demands an intimate knowledge of tooth form.

In the best form of denture, composed of bell-crowned teeth, the contact points will be

found to be in a line with the cutting edges of the incisors and cuspids, and slightly to the lingual of the buccal cusps of the bicuspids and molars. However, in thick-necked teeth, and those of a more rounded contour, the contact may be placed slightly more to the lingual. In some dentures, where the second and third molars are small and more rounded than usual, the contacts may be located midway bucco-lingually.

In the best-formed arches the contact points are near the occlusal surfaces, and only so far away from them as will result from the normal sloping of the marginal ridges. If the contact points be placed too close to the occlusal surface there will be a decrease in the amount of food that sweeps through the embrasures, and a consequent lessening of the scouring or polishing of the exposed approximal enamel, with the result that caries will have a greater opportunity to attack those surfaces. If the contact ridge is not reproduced, the tendency will be for food to wedge the teeth apart, allowing it to impact upon the septal gingiva, something which must never be permitted. The septal gingiva fills the septal space in the form of an arch, with its convexity toward the occlusal, and the contact point should be placed where it will be just over the crest of the arch of the septal gingiva.—H. E. FRIESELL, *Items of Interest*.

Indications for Use of Gold as a Base for Artificial Dentures. — (1) Partial dentures, particularly in cases where the bite is close.

(2) Upper cases where the palatal vault is very narrow.

(3) Cases where the posterior tuberosities in occlusion almost impinge on one another, or where natural molars of one jaw bite close on the tuberosity of the other.

(4) Single-denture cases where the bite is very close all around or at several points.

Lastly, there are those cases, fortunately but very seldom occurring, in which a peculiar abnormal condition of the palatal mucous membrane exists, and the contact of a vulcanite plate produces an immediate irritation and smarting sensation. In one such case a second vulcanite plate was constructed, the palatal surface being vulcanized against a tin matrix in order to secure greater smoothness. But the same irritating sensation was experienced on the insertion of the second carefully made plate. A swaged gold plate was then made, and when it was inserted and worn the symptoms of intolerance previously complained of were entirely absent.—D. MACKINTOSH SHAW, *Dental Record*.

Care of Deciduous Teeth.—There is no work which is of greater importance or attended with greater difficulties than that incident to the performance of dental operations upon the deciduous teeth; and there is no work connected with our profession that, in the long run, gives greater results. This work is more troublesome and requires more patience and skill than that done on the permanent teeth, yet the self-satisfaction of work well done at this opportune time more than pays. Many dentists do not care to treat children; they look upon this phase of their profession as temporizing. To be able to know how to perform successful operations that will preserve the deciduous teeth until the time that they should be lost, and which will prevent future ills and give to the child a healthy oral cavity, that he may go through life with the number of teeth that nature intended that he should have, is by no means a menial service.—FLORA N. HAAG, *Dental Summary*.

Churchill's Tincture of Iodin.—Churchill's tincture of iodine was originated by Dr. Fleetwood Churchill, the celebrated Dublin gynecologist, professor and author, for use in his practice. He knew that iodine was a strong antiseptic and also had an astringent action, and could be used successfully in gynecology. But he needed a "soluble and stronger tincture," one which would readily mix with water and not have the iodine precipitated, as is the case with the ordinary tincture. Dr. Churchill then made the addition of potassium iodide, which he found would keep the iodine in solution and prevent its precipitation so that the preparation would be soluble in water.

The National Formulary IV, 1916, under the title of *Tinctura iodi fortior*—stronger tincture of iodine—with the synonym *Tinctura iodi*, Churchill, Churchill's tincture of iodine—gives the official formula as follows:

Iodin	165 gm.
Potassium iodid	33 "
Water	250 cc.
Alcohol	to make 1000 "

—*American Journal of Pharmacy*.

Fractures Complicated with Abscesses.—The complication which most often attends fractures of the mandible is the formation of abscesses. It is my impression that this occurs in sixty to sixty-five per cent. of cases.

The most prolific causes for these abscess formations are: (1) As most fractures are compounded into the oral cavity, we may have a direct infection of the wound by the organisms of the buccal cavity. (2) Frag-

ments of necrosed bone or foreign bodies will exert irritation which will most often lead to suppuration. (3) Fragments of teeth or traumatized teeth within or in the proximity of the line of fracture. As fragments of bone or traumatized teeth containing granular pulps are the most prolific causes of these abscess formations, their presence should be determined by means of the radiograph, and whenever conditions permit, they are best removed prior to the reduction of the fracture. When suppuration ensues, the abscess should be treated independently of the fracture proper, by securing thorough drainage intra-buccally. Quite frequently, however, external incision must be resorted to. Suppuration will continue until all irritating factors are removed or exfoliated. Often some very small spiculae of bone which will not be disclosed by the radiograph are entangled in the meshes of the soft tissues, and will prolong suppuration. These can best be detected by gently probing the abscess tract, and so removed.—A. BERGER, *Dental Items of Interest*.

Interpretation of Radiographs.—Radiographs are at best uncertain means of diagnosis, and for any man, be he dentist, physician, or merely expert in radiography, to attempt to diagnose dental conditions from a radiograph alone, without accurate knowledge of the clinical conditions, will very often mean "ghastly mistakes."

We need the radiograph constantly in dental practice, not only for diagnosis but to judge of the progress of the work, and the only chance of getting its best service is when the operator fits himself to make and interpret his own radiographs. It is my understanding that in this state any radiographer without a dental degree who attempts to make a dental diagnosis from his radiographs infringes the dental law. I believe we should take measures to see that this feature of the law is enforced. I express this opinion, not because of any feeling concerning the ill effects of non-enforcement which may accrue to individual dentists, but because we shall not be doing our duty by our *clientèle* unless we do our best to protect them from incompetent and unwise radiographic interpretation.

It is essential that practitioners should fit themselves to interpret radiographs skilfully, and when any man has reached that point and is not ready to do his own radiography, he is in position to refuse to employ any radiographer who attempts to add unsolicited diagnosis to his functions.—HENRY W. GILLET, *Journ. of the Allied Dental Societies*.

Root-canal Operations.—This operation will, except in the hands of the men who have a proper conception of its place in dentistry, soon become a matter of history unless dentists perform it with the utmost caution, and use discretion in selecting the cases where it is indicated. It cannot be performed in a haphazard way, nor is it indicated in all teeth and for all patients. It is my firm conviction that but a very small number of pulpless teeth should exist in any one mouth. To leave in any patient's mouth a great number of pulpless teeth more or less infected is not necessary, and is distinctly contra-indicated. Do not misunderstand me. I am not condemning root-canal operations, but I do most heartily and with all the emphasis at my command condemn the abuse of this operation. No criticism ever uttered is too strong for much of the work that has been done under the guise of "treating teeth." At the present writing your essayist does not believe, if we have a systemic manifestation of an infection that is located around the root of a pulpless tooth, that we are performing the surest operation by simply doing a thorough root-canal operation, though we have cases on record where gratifying results are obtained by such procedure. The apical foramina are so minute through which to handle infected tissue beyond, that it is somewhat trusting to luck to handle them in this way. Either extraction or curetment appears to be a much more rational treatment.—ELMER S. BEST, *Journ. of the Allied Dental Societies*.

Systemic Conditions and the Teeth.—No man can affirm today just how intimate the relationship is between pulpless teeth and the many systemic disorders which in the recent past have so freely been attributed to them. In making this statement your essayist is conscious that he invites a vigorous storm of protest. The assumption is firmly fixed in the minds of the profession that many diseases, such as arthritis, endocarditis, etc., are directly traceable to infections from pulpless teeth, and he would be the last one to underestimate the teeth as possible causal factors in many of these affections. But he still affirms that, much as has been written on this subject, the percentage of cases of these affections which can be legitimately attributed to the teeth has never been definitely established. It will not do to state that because it is possible to demonstrate the same micro-organism in pulpless teeth and in arthritic joints, the teeth are invariably the primary cause of the infection.

It will not do to assume because a subsidence of the arthritic conditions has followed the extraction of the teeth in some instances that the teeth are always at fault. We should have more data on this subject. Account is not taken of the other clinical fact that in many instances the extraction of the teeth has not been followed by an amelioration of the systemic symptoms, and in many others the symptoms have cleared up without the extraction of the teeth. We need a stabilizer here. There is apparently as much evidence on the one side as on the other, and until we know more about the subject we are not justified in longer submitting to the wholesale extraction of teeth as ordered by physicians.—C. N. JOHNSON, *Journal of the Allied Dental Societies*.

Large Teeth and Small Jaws.—It is in no way the mission of the dentist as prosthodontist to foster the ignorant belief that small teeth are to be admired, as though they were a sign of refinement or of a good mental and physical inheritance. "Of all organs of the body, the teeth most exclusively and purely represent the current of stirp, germinal, or constitutional evolution." So that when natural teeth appear to be too large for their environment in the bony architecture of the face, one cannot say for certain that it is the teeth that are at fault. Rather is it probable that there was a failure (from whatever cause or causes) in commensurate development of the related bones and muscles. The teeth usually emerge without blemish or defect in any sculptured detail, and for a time at least the permanent teeth often remain undamaged on a "jerry" scaffolding, the erection of which has gone all wrong or has come to a standstill. The teeth themselves are a part of the physical inheritance that has come over inviolate in size and shape, and they indicate unmistakably the scale and plan of development of associated structures—structures that are more directly under the sway of normal or abnormal muscular action and of nurture generally.

Medical science has done little to elucidate the causes of this remarkable want of correlation in growth. Meanwhile, let the dentist see to it that even in the smaller sphere of his activities as prosthodontist, he does not "set a fashion" in small teeth; rather let him keep in evidence before the community the true comeliness of natural-sized teeth, and so perhaps help to bring nearer the day when the nation may come into its neglected dental inheritance.—D. MACKINTOSH SHAW, *Dental Record*.

Oxid of Zinc and Oil of Cloves.—It is not likely to be too frequently repeated that a temporary filling of zinc oxid and oil of cloves, placed over softened dentin in a vital tooth, will so dry out the dentin that it can be excavated with comfort to the patient. Such fillings may often remain in place for three months, and will then require a bur or sharp excavator to remove them. The influence of the filling is to reduce the inflammation of the pulp and the sensitiveness of the dentin.

Three months ago an adult case presented in which it seemed probable that the pulp must be removed from two vital teeth. There was no exposure, but the dentin over the area of the pulp was much softened. A temporary filling of oil of cloves and zinc oxid was placed in each tooth and the patient dismissed. The patient recently returned to the office with the pulps vital and the teeth in fine condition. The temporary fillings have been removed, the dentin excavated without causing pain, and the teeth filled.

The zinc oxid and oil of cloves should be mixed to a very thick paste, so that when it is patted with a spatula, moisture can just be seen. It should be patted to place in the cavity, and saliva immediately permitted to flow over it.—E. S. ULSAVER, *Dental Digest*.

Gingival Shrinkage in Gold Inlays.—The question most frequently asked is, "Why does the gold do all its shrinking at the gingival margin?"

Gold has no selective function. It does not shrink any more at the gingival margin than it does any place else, but I will tell you some of the reasons why we so often see an open joint at this point.

- (1) Failure to bevel the gingival margin.
- (2) Working the wax instead of using cast wax.
- (3) Use of soft wax, which becomes distorted and prevents the inlay from being seated.
- (4) Failure to hold the wax under pressure until cold when the wax pattern is taken.
- (5) Distorting wax while removing from the cavity.
- (6) Releasing the elasticity by allowing the wax pattern to stand too long before investing.
- (7) Allowing the investment to set over night before burning out the wax, which frequently causes the investment to crack, enlarging the inlay.
- (8) Nodules or moss on the gold due to

using poor investment, or improper manipulation of the investment.

(9) Investing warm, distorting the wax by releasing the elasticity.

(10) Casting into a hot mold; a hot mold is a distorted mold.

(11) Overheating the investment when burning out the wax.

(12) Using too much pressure in casting.

(13) Using alloyed gold.

(14) Mixing the cement too thick, making it impossible to force the excess from the center to the periphery.

(15) Using coarse cement, which cannot be compressed to the same degree as a finely ground cement.

Taggart's process of casting is probably the greatest thing that ever came to dentistry. Every element of weakness advanced against the cast gold inlay can be traced to faulty technique. When this technique has been mastered by the profession there will be no opposition to the method.—LEIGHTON B. MORRIS, *Dental Review*.

Ulcerative Stomatitis.—In ulcerative stomatitis the systemic factor plays an important part. It does not occur unless the vitality is greatly reduced by some general disease. It may follow the continued administration of mercury, especially if the teeth and the mouth, as a whole, are not placed in good condition before the treatment is begun.

The ulcers in ulcerative stomatitis start upon the gingival tissues as a rule, although they may be located upon any part of the mouth, the buccal or palatal mucous membranes, the floor of the mouth, or upon the tongue. Ulcerative stomatitis is contagious, frequently spreading to all the members of a family, and often assumes epidemic form among soldiers and in factories.

The disease is not strictly local. General symptoms characteristic of toxemia are frequently present. There may be intestinal symptoms, viz, lack of appetite, rise in temperature, and profound depression. The gangrenous decomposition of the ulcerated areas gives off a very offensive odor, and the tissues of the mouth become so painful as to render impossible the mastication of food. The infection may spread to the periosteum, causing destruction of the alveolar process and loosening of the teeth.

The treatment consists in local and systemic measures. The local measures should be given in the following steps:

(1) Thorough scaling and polishing of the teeth.

(2) Temporary fillings where needed.

(3) Ten to 20 per cent. silver nitrate applied against the ulcerated tissues.

(4) Frequent irrigations of the mouth with potassium permanganate solutions of proper strength.

The systemic treatment is as follows:

(1) Rest. Non-irritating diet; abstinence from tobacco and alcohol.

(2) Laxatives to insure complete elimination.

(3) Administration internally of potassium chlorate; 1 teaspoonful every three hours of a solution of potassium chlorate, 24 grains to the ounce. In children reduce the dose to 10 or 12 grains to the ounce.—J. ENDELMAN, *Pacific Dental Gazette*.

OBITUARY

Dr. Simeon H. Guilford.

[SEE FRONTISPICE.]

DIED, Saturday, January 18, 1919, in his seventy-eighth year, after a short illness, in the Samaritan Hospital, Philadelphia, Pa., SIMEON HAYDEN GUILFORD, A.B., M.A., Ph.D., D.D.S.

SIMEON HAYDEN GUILFORD, dental surgeon, was born at Lebanon, Pa., April 11, 1841, son of Simeon and Catherine Elizabeth (Doll) Guilford. His earliest paternal American ancestor was Paul Guilford, who came from England about 1650 and settled near Boston, Mass. From him the line of descent is traced through his son Paul; his son William, to his son Simeon (1751-1844) and his wife Ruhamah Hayden, who were the grandparents of Simeon Hayden Guilford. Simeon Guilford, grandfather of the subject, served as ensign in the war of the revolution, crossed the Delaware with General Washington, and was present at the execution of Major André. Simeon, father of our subject, and a native of Northampton, Mass., became a celebrated civil engineer; was builder of the Erie Canal, New York, and the Union Canal, Pennsylvania, subsequently becoming an iron-master and building furnaces in Schuylkill and Lebanon counties, Pennsylvania.

Dr. Guilford received his preliminary education in the public schools and at Lititz (Pa.) Academy, and was graduated at Franklin and Marshall College in 1861 with the

degree A.B., from which institution he received the degree A.M. in 1864, and that of Ph.D. in 1886. During the winter of 1861-2 he taught school, and then entered the Federal army for the civil war as private in company E, 127th regiment, Pennsylvania Volunteer Infantry, which was attached to the 3d brigade, 2d division, 2d corps, Army of the Potomac. He participated in various engagements and battles, including Fredericksburg and Chancellorsville, and was mustered out toward the close of 1863. He then began the study of dentistry, and was graduated from the Pennsylvania College of Dental Surgery in 1865 with the degree D.D.S., and in 1884 he received the honorary degree D.D.S. from the Philadelphia Dental College. Following his graduation he began the practice of his profession at Lebanon, and in 1872 removed to Philadelphia, where he has since resided and practiced. In 1880 he had temporary charge of a dental practice in Paris, France.

In June 1915 he organized and accompanied a unit of four from among the teachers in the Philadelphia Dental College (Temple University), which served for three months in the dental section of the American Ambulance, Paris, ministering to the needs of the wounded soldiers and repairing fractured jaws.

In 1881 he was elected to the chair of operative and prosthetic dentistry and orthodontia in the Philadelphia Dental College, and from 1896 to 1918 he was dean of that institution except for an interval of two

years. He is the author of "Nitrous Oxid: Its Properties, Methods of Administration, and Effects" (1887); "Orthodontia" (four editions, 1889, 1893, 1898, 1905); wrote the chapters on Orthodontia, Anomalies of the Teeth and Maxilla, and Hypercementosis in "The American System of Dentistry" (1886), and chapters on Preparation of Cavities and Contour Fillings in "The Textbook of Operative Dentistry" (1900-3-5); was a frequent contributor to dental journals, and was regarded as an authority upon orthodontia. He was past president of the National Association of Dental Faculties, Pennsylvania State Dental Society, Odontological Society of Philadelphia, Philadelphia Academy of Stomatology, and National Institute of Dental Pedagogics; past vice-president of the National Dental Association and National School of Dental Technics, and was also a member of the American Dental Association, American Dental Society of Europe; honorary member Reading (Pa.) Dental Society, Dental Society of Southern New Jersey; associate fellow American Academy of Dental Science, Boston, and associate member First District Dental Society of New York. He was also a member of Phi Kappa Sigma Fraternity, of the University Club, and of Phi Beta Kappa.

Dr. Guilford found his chief recreation in natural science; particularly in the field of geology and mineralogy. His political affiliation was with the republican party, and he was a member of the Presbyterian Church.

He was married at Lebanon, Pa., June 8, 1868, to Virginia Susan, daughter of George Gleim, of Lebanon.

He is survived by his widow, one daughter, Mrs. William Dalzell, Pittsburgh, and one son, Dr. Dudley Guilford, who practices dentistry in Philadelphia.

The above biographical sketch gives the salient points in the life of Dr. Guilford, but it does not tell the reader of the character of the man or the service he rendered to the public as a practitioner and to the dental profession as a teacher. As a classmate and friend of more than fifty years it may seem fitting that I should make mention of his many and brilliant virtues.

He graduated from the Pennsylvania College of Dental Surgery in 1865. He located at

Lebanon, Pa., his home town, remaining there in successful practice for seven years, when he removed to Philadelphia and located in the same block and three doors distant from my own home. The friendship which we formed in college was kept warm by frequent interchange of letters and occasional meetings, and it was a source of pleasure and satisfaction to me that he had removed to a larger field of usefulness and had become a near neighbor with whom it was pleasant to associate and discuss the various phases of our professional work.

Dr. Guilford had not been many years in Philadelphia before the chair of operative and mechanical dentistry in the Philadelphia Dental College became vacant, and he was invited to fill that professorship, which he did for thirty-eight years.

As a student in dental college Dr. Guilford was earnest and industrious; he impressed me at that time as one eager to learn all that was to be known in the profession which he had chosen. I remember him as painstaking and thorough in whatever he undertook. As a practitioner he was conscientious and skilful, as is well attested by the operations which have stood for many years and will still stand as monuments of his skill. As a teacher Dr. Guilford was eminently successful. He was by nature a student, and having possessed the advantages of a college training he was well qualified to fill a professorship in the profession which he had chosen as his life-work. The students who listened to his lectures have ever been wont to speak of him as a teacher and instructor of singular ability.

Dr. Guilford was industrious. Few men have had the "work habit" more largely developed than he. Having inherited from his ancestors a strong constitution, he was able to work almost incessantly, as practitioner and teacher and dean of the college, without apparent fatigue—and this, too, during a long period of years. During the fifty and more years of hard work he did much and did it well. He has left behind him an example for men to emulate. A large number of friends will remember him with pleasure and mourn his loss, and a host of students who listened to his teaching will remember with satisfaction that they were his pupils.

E. T. D.

Mr. Edward Rowan.

MR. EDWARD ROWAN, founder and president of "Edward Rowan, Incorporated," died on Sunday, January 19, 1919, at his home in New York City, after a short illness.

Mr. Rowan was born in 1850, and in 1872 became interested in the manufacture of gold for dental purposes; in 1878 he established the business now known as "Edward Rowan, Inc.," the incorporation having taken place in 1908.

Mr. Rowan was well known and highly respected among the dental manufacturers of the country as a man of sterling character and strong convictions; quiet in his manner, sincere in his friendship, with a nobleness of character that won for him the love and esteem of all who knew him.

"In Memoriam" Resolutions.

Dr. J. C. Higgins.

THE following resolutions on the death of Dr. J. C. Higgins, McAdoo, Pa., were adopted by the Hazleton, Pa., Dental Society.

Whereas, the Divine Ruler of the universe has, in his infinite wisdom, seen fit to summon to his heavenly home our dearly beloved brother, J. C. Higgins; and

Whereas, our community has thereby lost a citizen held in highest honor and esteem, our society and profession a skilled and zealous brother, and the family a kind and devoted husband and father; therefore be it

RESOLVED, That we, members of the Hazle-

ton Dental Society, do hereby express our earnest and heartfelt sympathy to the family of our dear brother in their great bereavement; and be it further

RESOLVED, That a copy of these resolutions be sent to the bereaved family, that they be published in the DENTAL COSMOS, and that they be inscribed upon the minutes of the society.

P. X. O'DONNELL,
F. B. MACDONALD,
J. H. HARRISON,

Committee.

Dr. Deran G. Gairdan.

THE following resolutions on the death of Dr. Deran G. Gairdan were adopted at a meeting of the Academy of Stomatology of Philadelphia on Thursday, January 16, 1919.

Whereas, it has pleased Almighty God to take from our midst our fellow member, Dr. Deran G. Gairdan, in the most promising period of his career; therefore be it

RESOLVED, That we, the members of the Philadelphia Academy of Stomatology, hereby express our sorrow at the loss thus sustained by the profession as well as the Academy in the person of one whose genial personality, high character, and professional skill endeared him to all; and be it further

RESOLVED, That as a tribute to his memory the present resolutions be spread upon the minutes, and that a copy thereof be sent to his family in expression of sympathy.

H. B. MATTEOSSIAN, *Chairman*,
M. HAGOPIAN,
W. A. JAQUETTE,

Committee.

ARMY AND NAVY DENTAL NEWS

Report of the Surgeon-general of the U. S. Army on the Present Status of the Dental Corps.

[We have just received from the War department the annual report of the Surgeon-general of the Army to the Secretary of War, and for the information of those concerned we publish in full that portion which deals with the Dental Corps and its activities during the war.—Ed.]

1. ENROLMENT OF DENTAL OFFICERS.

THE records show that when the Government entered the present war the American army had 86 dental officers, 18 of whom were captains and the remainder first lieutenants, and although our dental law permitted dental officers to advance to the grade of major, this was only possible after said officer had a record of twenty-four years of service, and limited the number to 8, regardless of how many there might be who had served the required twenty-four years. Of the 86 then on duty, only 55 were stationed in the United States, and these were widely scattered.

Although a law existed at this time which permitted the organization of a Dental Reserve corps, no rules or regulations had been promulgated to organize such a corps until after we entered the present war, and although many dentists were eager to enter the dental reserve corps, the early plan pursued made it necessary for an applicant to forward his request to the Surgeon-general's office. The formal application was then furnished, to be filled out and returned to Washington. The applicant was then communicated with and was advised when the next board was to meet in his own state or an adjacent one—with the result that many days or weeks would elapse from the time the applicant would first apply until his completed papers would arrive for final decision. To prevent, if possible, this delay, the chairman of the committee on enrolment and legislation of the dental committee of the General Medical Board presented to the Surgeon-general, on June 1,

1917, the plan whereby he was to be permitted to select representative men of the dental profession who, by education and experience, were well qualified to give professional examination to any applicant who desired to be commissioned in the dental reserve corps. This request, although most unusual, was immediately accepted and the authority granted. Twenty-four hours thereafter preliminary dental examiners were appointed in every state in the union.

The men appointed as preliminary dental examiners were the deans of the well-recognized dental institutions, the secretary of each of the state dental examining boards, and such dentists in addition as the service demanded.

The end result of the appointment by the Surgeon-general of the preliminary dental examiners is found in the fact that although on the day of its authorization, June 1, 1917, or relatively two months after the beginning of war, there were only five officers in the dental reserve corps, yet we find that on September 18, 1917, or three and one-half months thereafter, all examinations for general practitioners were discontinued, as the War department had a sufficient number of commissioned dental officers and completed applications on file for action to care for the present and immediate future needs of the army.

Since the declaration of war the number of dental officers in the army has increased from 86 in the dental corps, regular army, to 212; National guard, from nothing to 253; dental reserve corps, from nothing to 5372; making a total of 5837—or a sufficient number to supply the quota now being assigned for an army of 5,000,000—which gives to this nation a greater number of dental officers subject to military call than all the nations combined represented by the term "the Allies."

The following two facts are considered worthy of being recorded: (1) The commission of first lieutenancy was tendered nearly

6000 dentists, and all but 139 of these have accepted. (2) Although the dental reserve corps of the army is authorized for its present strength to have 2118 captains and 1265 majors, there have only been 250 promoted to the grade of captain and 65 to the grade of major. This can be accounted for by the splendid plan that has been followed in regard to the question of promotion, for here we find that every dentist coming into the service must accept the grade of first lieutenant, and he cannot be advanced until after being placed on active duty, and then only does he become eligible when he has been recommended by his superior officers through military channels.

2. DENTAL LEGISLATION.

On October 6, 1917, a dental law was enacted by the Senate and House of Representatives, in Congress assembled, and approved by the President, which gave to the Dental corps of the regular army the same grades and percentages within the grades then allowed or that might thereafter be allowed by law for the Medical corps of the regular army. This bill was referred by the Surgeon-general to the Adjutant-general of the army for interpretation, and the decision was reached that under the present strength of the army, the dental corps was authorized to have 9 colonels, 17 lieutenant-colonels, and 67 majors, the remainder of the authorized strength of the corps to be distributed in the grades of captain and first lieutenant.

3. FREE DENTAL SERVICE.

On August 19, 1917, with the approval of the Surgeon-general, permission was sought from the Provost Marshal-general to secure franking privileges for the Preparedness League of American Dentists, and concurrence in a plan which would make it possible for all men who had been accepted for general military service to be advised to appear before the members of that organization to have any urgently needed dental operations performed, without expense to themselves or to the Government, previous to their arrival at camp. This work was considered imperative at that time, for the reason that there was only being assigned one dentist per thousand of the total strength of the army, and also the manufacturers were unable to meet the excessive demands made upon them in the early days of the war.

The Provost Marshal-general heartily approved of the proposal made, and gave every assistance possible, even urging by personal letter the governor of each state to inform

all local and medical advisory boards that he approved of their appointing a dentist for volunteer service on each board to aid in the physical examinations of all men called before them, and expressed it as his opinion that the patriotic service offered by the dental profession would be of great value not only for the comfort, but for the efficiency of the national army.

Following the department's approval, a dental reserve corps officer was assigned to the Preparedness League headquarters in New York, who in co-operation with the officers of that organization has increased it in the past year from about 4000 to 16,000, and as a concrete example of what the officers and members have contributed in the form of gratuitous service for men who have been accepted for general military service, it is here recorded that they have furnished the material and performed 375,000 gratuitous operations for men selected for general military service. It should also be stated that through their activity three dental motor-car ambulances have been presented to the Government, and another one is to be tendered in the immediate future.

4. SURGERY OF THE HEAD.

On June 15, 1917, the Surgeon-general approved of the organization of the section of the Surgery of the Head, which had among other duties the securing of a *personnel* especially qualified to care for diseases and injuries of the brain, eye, ear, nose, throat, face, and jaws, and placed in charge a member of the medical corps, regular army—the commissioned *personnel* of the surgical head unit to consist of one specialist each for the brain, eye, ear, nose, and throat, one plastic or oral surgeon, and one dental oral surgeon, competent to care for fractures, impactions, and pathologic diseases to which the teeth and jaws are subject.

It is believed that by including dentists in the organization of the surgical head unit, better service will be given to our wounded soldiers who sustain injuries of the face and jaw than could possibly have resulted had these cases been handled without the assistance of those specially trained dental officers, and in addition a splendid opportunity is given to members of this profession to increase their ability and knowledge of surgical principles involved in the management of these surgical lesions.

5. EDUCATIONAL ACTIVITIES.

In May and June 1917 a majority of the dental schools of this country instituted

gratuitous courses of special instruction for applicants desiring to enroll in the dental reserve corps. The course was approved by the Surgeon-general, and was of such a nature as to fit those in attendance to be better officers for hospital and field service. The instruction embraced the relationship of the dental officers to the supply and administrative departments of the army and military law. A number of the institutions have repeated these courses at various intervals, one of which had a total enrolment of 624. It is a conservative estimate to state that between 4000 and 5000 dentists attended these courses of instruction without expense to themselves or to the Government, and the dental educational institutions of this country have a right to feel proud of this contribution.

On October 15, 1917, by authority of the Surgeon-general and under the direction of the subsection of plastic and oral surgery of the surgical head unit, courses of instruction in plastic and oral surgery were instituted at Washington University dental school, St. Louis, Mo., the Northwestern University dental school, Chicago, Ill., and the Thomas W. Evans Museum and Dental Institute school of dentistry, University of Pennsylvania, where medical and dental officers were detailed for instruction. The medical officers were given special instruction in plastic surgery, blood transfusion, and bone transplantation, and the dental officers in bone-fragment fixation by intra-oral splints, the systemic effects of local infections, and surgical anatomy of the face, jaws, and neck. These courses were discontinued in March 1918.

On March 15, 1918, a school for army dental officers was instituted at Camp Greenleaf, Chickamauga Park, Fort Oglethorpe, Ga., in connection with the medical officers' training-camp, for the military and professional instruction of dental officers and their authorized dental assistants.

The duration of the general course of instruction for the dental officers is two months. The first month is given over to 180 hours of general military training, and the second to 70 hours of special military training and 110 hours devoted to professional subjects that have a definite relation to general dental practice as it should be conducted in the army. Each class consists of from 80 to 100, and a small percentage of each is retained for training to qualify them for assignment as division dental surgeons or assistants to the division dental surgeon. In the immediate

future a few will be retained from each class for special instruction in roentgenology, as we have need for two dental roentgenologists for each cantonment in this country, authorization having recently been received for the installation of complete radiographic equipment in the dental unit building in each camp.

In this officers' training-camp we have dentists receiving military training that is of such a nature as will greatly increase their physical and professional efficiency. Furthermore, in so far as we know, this is the only country giving such extensive special training in military and professional subjects to dental officers and their authorized assistants.

Achievements of the X-ray in the Army.

VARIOUS types of X-ray apparatus were developed and used in the army during the war, with most gratifying results. Each type was subjected to the most thorough tests in actual service, and proved its usefulness. Special mention should be made of the portable set, which was installed in a motor ambulance and moved expeditiously to the advanced lines, where it rendered inestimable service to the surgeons. Of equal value has been the bedside set—a small portable affair, which can be carried by a hospital attendant or rolled on casters directly to the cot of a patient. This set has been utilized on a large scale in the treatment of influenza and pneumonia cases. In Walter Reed Hospital 4000 patients suffering with the epidemic have been photographed, the pictures being taken without disturbing the patient in the slightest degree. The value of the X-ray in the treatment of pneumonia has been amply demonstrated, and there is no doubt that the use of these handy sets will be further extended. They are already in active use at hospital No. 14, Fort Oglethorpe, Ga., also at Camp Devens, Camp Lewis, and various other places, with excellent results. At Camp Lewis a record in examinations was made which has probably never been exceeded; no fewer than 40,000 exposures were made, of which 14,000 were chest cases. All previous records were broken in the number as well as the promptness of examinations to detect not merely the presence of disease, but of foreign bodies, broken parts, etc. Both these X-ray sets are purely American inventions, developed entirely by Americans. An achievement in which the officials responsible for it take pride is the fact that not a man serving in the

American army in France who needed an X-ray examination failed to get it, and within a very short space of time.—*Army and Navy Register*.

Disabled Soldiers Being Educated.

TEN thousand disabled soldiers are now being given some sort of educational work in 43 different hospitals. Thousands more are on their way and will receive the same help. In order to handle properly the educational work in the new hospitals with the increased numbers of patients, a material increase in the educational *personnel* is necessary.

By a recent order, transfers may be made from any branch of the service to the educational service in the medical department. Acting upon this, officers and enlisted men with special qualifications are being transferred from their present assignments where their services are no longer needed, to the division of reconstruction. They are to become instructors or supervisors of the various lines of school work.

Instructors and supervisors are still needed for almost all lines of technical work; but the need is most urgent in the following subjects: Agriculture, carpentry, auto mechanics, typewriting, drafting, printing, tractor operating, machine shop, electricity, and leather work.

Officers or enlisted men who are desirous of transferring to this service should apply to the local educational officer at the base hospital or to the division of physical reconstruction, Surgeon-general's office, Washington, D. C., and full information will be supplied.—*Army and Navy Register*.

Army Dental Corps.

For some months promotions in the army dental corps have been suspended, although examinations for the promotion of a large number of officers of the regular establishment were held as long ago as last June. Some of the officers examined were in France, and a part of the delay in announcing the advancements is attributable to the fact that those five officers with the American Expeditionary Force were examined by boards that were not composed exclusively of officers of the regular service. They will have to be re-examined in accordance with law. Another

cause of the delay for a time was the necessity of re-examining First Lieut. Arthur J. Hart, dental surgeon; but recently four officers who are junior to him on the list have been promoted, which incident has created much curiosity as to the reason for these particular advancements without reference to others equally entitled to favorable action. The volume of work in the War department is also responsible for the delay to some extent, and it has now been decided not to further postpone promotions in the dental corps. Those officers who by virtue of their service are due for promotion will be advanced pending examination, together, of course, with those who have already fully qualified. This will mean the promotion of thirteen first lieutenants to the grade of major and seventy-eight first lieutenants to the grade of captain.—*Army and Navy Register*.

Assignments.

Army Dental Corps.

Week ending January 18th.

Lieut.-col. Frank L. K. Laflamme to Washington, and report to Surgeon-general for duty in his office.

Maj. John H. Snapp to Camp Jackson, S. C., for duty.

Maj. Eugene Milburn to report by telegraph to commanding general, Eastern department, for assignment to duty.

Week ending February 8th.

Lieut.-col. Raymond E. Ingalls to Linda Vista, Cal., Camp Kearney, for duty.

Maj. Lowell B. Wright to Fort Leavenworth, Kan., disciplinary barracks, for duty.

Maj. Crittenden Van Wyck to Camp McClellan, Ala., for duty.

Maj. Ernest E. Buell to Fort McHenry, Md., general hospital No. 2, for duty.

Promotions.

Announced January 18th:

To be MAJORS—permanent establishment, from October 6, 1917: First Lieuts. Chester Denham, Harold E. Albaugh, Harry E. Smalley, Wm. D. White, and Arthur J. Hart.

To be MAJOR (appointment by orders confirmed): American Exp. Forces, Capt. B. L. Brun.

Preparedness League of American Dentists.

ORGANIZED UNDER THE AUSPICES OF THE N. D. A.

Preparedness League Notes and News.

From R. OTTOLENGUI, *Director of Publicity.*

FROM THE PRESIDENT.

THE RETURNING DENTAL CORPS OFFICERS.

Every day it is becoming more apparent that many of our profession who left well-established and hard-won practices are returning to find nearly everything swept away down to the lowest rung of the ladder which, through honest toil and travail, had long been passed in the upward climb.

An urgent call for help goes out from the President to every member of the League to give our brothers the fullest measure of co-operation right away. Tomorrow will not do! It must be done TODAY!

Go to each returned dental corps officer in your neighborhood and ascertain his circumstances. Call all dentists together surrounding his location and get them to send patients to him whenever possible. You can well afford to make this sacrifice. Make it a point, also, to acquaint the public of his return to practice and of his need of support. You will be surprised at the assistance you can render in thus discharging a positive obligation.

It is distressing to report that undue advantage is being taken of our boys in this way, and we sincerely trust our members will do all they can to re-establish them in that which justly belongs to them. He who takes undue advantage of these conditions does not merit professional relationship with his *confrères*. You will learn in due time that these men have sacrificed more than we at home were aware of, and we would emphasize the truth that he who attempts to gain through their misfortunes must suffer eventual defeat.

The President earnestly requests all returning dental corps officers to communicate with him, that such assistance as is possible may be rendered.

FUTURE WORK OF THE LEAGUE.

Although organized as a war emergency measure, conditions have so changed that there is a definite call for the League in a

broader and more embracing sense. In fact, those who rightly read the signs of the times are united in the belief that the fullest usefulness of the organization is yet to come.

The identity of the League will, no doubt, be absorbed by the broader conception, and we will be big enough to take up service for our profession throughout the Allied nations. Should not the dentists of the United States and Canada, who have in reality gained greatly by the war, give every possible assistance to our brothers who have suffered loss of practice, home, money, and even worse? Is there not a call to you through professional sympathy and the brotherhood of man to come forward in this, their hour of darkness and need, and stretch forth a helping hand? Can you compute the wonderful influence thereby exerted toward establishing bonds that will live for all time?

Let us see the vision and act without delay. Let us keep alive the great principle upon which the League was founded and which has made it so great a power for good. Our National Dental Association needs such an organization to forward public service work in its name, and to do such service for the welfare of the people as cannot be accomplished by a society whose activities are purely scientific in character. We must remember that the old order of things has been completely changed by conditions beyond our control, therefore let us quickly adjust ourselves accordingly and meet these new conditions as we have so successfully met everything thus far.

The League is gradually becoming adjusted to the new conditions, and its officers are planning to develop into a broad organization of international character devoted to public service work and such activities as come within the rightful field of our energies.

POST-WAR COURSE OF THE LEAGUE.

The second Special Course given at New York from Feb. 3d to 8th, inclusive, proved to be an intellectual feast of the rarest quality. It would be impossible to give an adequate idea of its value to those who were

fortunate enough to enjoy it. It was an unqualified success.

The demand for a Special Course in Post-War Oral Surgery and Prosthesis is now established, and the League will be glad to correspond with all who wish to take it, with a view of bringing it within reach. We hope to carry it to every large city in this country.

RED CROSS "HOME SERVICE" WORK.

General co-operation of League officers and members is being experienced throughout the country by the Red Cross "Home Service"

section. This most worthy object, that of giving needy families of our soldiers dental treatment, should be participated in by every loyal dentist.

We would especially urge your care of the families of those who made the "supreme sacrifice." We have a solemn duty to perform toward all such, especially those who are handicapped by lack of means, and we must keep constantly in mind that our work is not yet done. Our slogan must be

"CARRY ON!"

J. W. BEACH. *President.*

SOCIETY NOTES AND ANNOUNCEMENTS

NOTICES should reach the Office of the DENTAL COSMOS *not later than the 11th or 12th of the month preceding that of publication.*

Coming Dental Society Meetings.

With the National.

NATIONAL DENTAL ASSOCIATION. New Orleans. October 20th to 24th.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS. New Orleans. October 20th to 24th.

NATIONAL ASSOCIATION OF DENTAL FACULTIES. New Orleans. October 20th to 24th.

ASSOCIATION OF MILITARY SURGEONS. New Orleans. October 20th to 24th.

DELTA SIGMA DELTA FRATERNITY. New Orleans. October 20th.

XI PSI PHI FRATERNITY. New Orleans. October 20th to 24th.

AMERICAN SOCIETY OF ORTHODONTISTS. St. Louis. March 10th to 12th.

PSI OMEGA FRATERNITY, NEW YORK ALUMNI CHAPTER. New York City. May 3d.

State Meetings.

MARCH.

DISTRICT OF COLUMBIA DENTAL SOCIETY. Washington. March 18th to 20th.

VERMONT STATE DENTAL SOCIETY. Burlington. March 19th to 21st.

APRIL.

ALABAMA STATE DENTAL SOCIETY. Birmingham. April 7th to 11th.

CONNECTICUT STATE DENTAL ASSOCIATION. Hartford. April 15th and 16th.

KANSAS STATE DENTAL SOCIETY. Topeka. April 14th to 16th.

MICHIGAN STATE DENTAL SOCIETY. Detroit. April 7th to 12th.

MISSOURI STATE DENTAL ASSOCIATION. St. Louis. April 14th to 16th.

MISSISSIPPI STATE DENTAL SOCIETY. Clarksdale. April 15th to 17th.

PENNSYLVANIA STATE DENTAL SOCIETY. Pittsburgh. April 29th and 30th and May 1st.

TEXAS STATE DENTAL SOCIETY. Waco. April 21st to 24th.

WEST VIRGINIA STATE DENTAL SOCIETY. Wheeling. April 9th to 11th.

MAY.

ARKANSAS STATE DENTAL SOCIETY. Pine Bluff. May 19th.

ILLINOIS STATE DENTAL ASSOCIATION. Peoria. May 13th to 16th.

INDIANA STATE DENTAL SOCIETY. Indianapolis. May 20th to 23d.

IOWA STATE DENTAL SOCIETY. Des Moines.
May 6th to 8th.

MASSACHUSETTS STATE DENTAL SOCIETY.
Boston. May 7th to 9th.

NEBRASKA STATE DENTAL SOCIETY. Omaha.
May 20th to 22d.

JUNE.

DENTAL SOCIETY OF THE STATE OF NEW
YORK. Syracuse. June 12th to 14th.

FLORIDA STATE DENTAL SOCIETY. Tampa.
June 18th to 20th.

GEORGIA STATE DENTAL SOCIETY. Savannah.
June 11th to 13th.

KENTUCKY STATE DENTAL ASSOCIATION.
Louisville. June 9th to 12th.

NEW HAMPSHIRE STATE DENTAL SOCIETY.
Manchester. June 18th to 20th.

NORTHERN OHIO DENTAL ASSOCIATION.
Cleveland. June 2d to 4th.

Examiners' Meetings.

IOWA BOARD OF EXAMINERS. Iowa City.
March 10th.

MASSACHUSETTS BOARD OF EXAMINERS.
Boston. March 17th to 21st.

MISSISSIPPI BOARD OF EXAMINERS. Jack-
son. June 17th.

NEW JERSEY BOARD OF REGISTRATION.
Trenton. March 3d to 7th.

RHODE ISLAND BOARD OF REGISTRATION.
Providence. March 18th to 20th.

SOUTH CAROLINA BOARD OF EXAMINERS.
Bamberg. June 16th.

VERMONT BOARD OF EXAMINERS. Mont-
pelier. June 30th and July 1st and 2d.

Philadelphia Dental College.

ALUMNI SOCIETY.

THE annual meeting of the Alumni Society
of the Philadelphia Dental College (Temple
University) will be held on Wednesday, April
16, 1919, in the College building, at 18th and
Buttonwood sts. All members should be
present.

FRANKLIN S. FLUCK.

CLASS OF 1914.

THE reunion of the class of 1914 of the
Philadelphia Dental College will be held on
Wednesday, April 16, 1919, in the College
building, at 18th and Buttonwood sts.

All members who expect to attend the re-
union will kindly communicate with

LEON A. HALPERN,
2438 N. 33d st., Philadelphia, Pa.

Dewey School of Orthodontia.

ALUMNI SOCIETY.

THE Alumni Society of the Dewey School
of Orthodontia will hold their next annual
meeting in St. Louis, Mo., March 6, 7, and 8,
1919. The usual high standard of the meet-
ings of this society will be maintained. All
interested in orthodontia are welcome. Ad-
dress communications to

GEORGE F. BURKE, Sec'y,
741-43 David Whitney Bldg., Detroit, Mich.

National Mouth Hygiene Association.

DEPARTMENT OF EXTENSION LECTURES.

A COMPLETE lecture set, consisting of full
manuscript and thirty-six specially selected
and prepared lantern slides covering the sub-
ject of Mouth Hygiene is furnished by this
association to members of state dental socie-
ties and others who may be qualified to
present the subject on the lecture platform.

For rental and sale terms and other par-
ticulars address the undersigned.

EDWIN N. KENT,

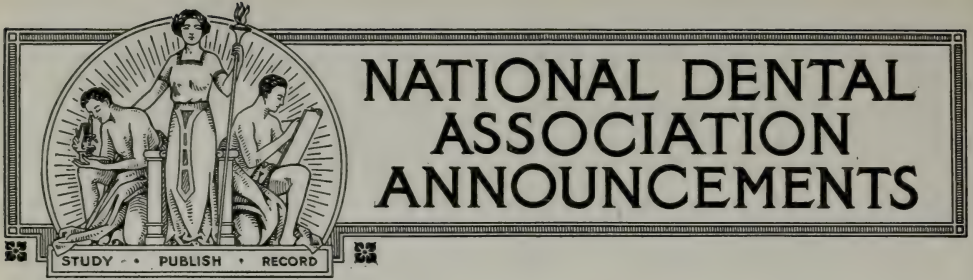
Director of Extension Lectures.
330 Dartmouth st., Boston, Mass

Forsyth Dental Infirmary for Children.

NEW DEPARTMENT—LIBRARY AND MUSEUM.

THE trustees and director of the Forsyth
Dental Infirmary for Children have author-
ized the creation of a new department, to be
known as the "Library and Museum." They
solicit from the dental profession contribu-
tions of books and dental periodicals, particu-
larly those out of print and not readily
obtainable by purchase; also specimens of
dental abnormalities, casts, or specimens of
unusual structures of dental interest, for all
of which permanent acknowledgment will be
given.

FREDERICK A. KEYES, D.M.D.,
Librarian and Curator of Museum.



PLANNING FOR THE TWENTY-THIRD ANNUAL MEETING

TO BE HELD AT

New Orleans, October 20 to 24, 1919.

FROM PRESIDENT VIGNES.

WHATEVER your plans may be for 1919, make sure that they include attending that convention in New Orleans in October.

It will be more than an ordinary National convention. It will be more, even, than a National convention in a city that proudly counts among its citizens more dentists than any other city in the South. It will be a convention where you'll get more, even, than the benefit of mingling with the best dentists of America—which is to say, the best dentists in the world! It will be a convention in a city that is looking ahead and planning to make your visit in October 1919 one that you'll remember through every one of the years to come—and a city that has the facilities to do it.

Some of you have been in New Orleans before. You *know*! For those who haven't, here is a brief sketch of what awaits you:

Do you like comfortable quarters—uncrowded—when you attend a National convention? New Orleans, through the experience of years of Mardi Gras throngs, can house in her hotels nearly 50,000 visitors at once—without resorting to cots in the hall or blankets on the billiard table. Those hotels can give you anything offered by any hotel in the world in comfort, in quiet, and in luxury. And their rates are human.

Do you like the best cuisine in the world? New Orleans has it, at her world-famous

restaurants with world-famous chefs—chefs that in some cases have been five generations in the kitchen. Do you know the joys of oysters Rockefeller, of planked pompano, of gumbo Creole, of crawfish bisque, of jambalaya, of dripped coffee? They're waiting your arrival.

Do you like picturesque scenes—sites immortalized in a history that goes back unbroken for two centuries? Here it is, unchanged, before your eyes just as men now dead for generations once looked upon it—men who made that history you have read.

For, while "across Canal street" the "American City" offers skyscrapers and garden districts of beautiful residences, rose-embowered all the year round, the "Old French Town" yields sights no visitor ever forgets.

Here, in October 1919, you'll see the historic Place d'Armes—where the Casket Girls of France's Louis landed; where landed the exile Acadians; where Jackson marched forth to the Battle of New Orleans. You'll see the St. Louis Cathedral, where he celebrated victory; the Chalmette battlefield, where he won the renown that led to the White House; the Cabildo, in whose stone-flagged rooms the Province of Louisiana was transferred to the United States; Don Alexandro O'Reilly's headquarters, where the picturesque and bloodthirsty Spanish captain-general ruled in his "reign of terror" in 1700; the house built

to receive Napoleon, when he was to have been rescued from St. Helena; the coffee-house frequented by Jean Lafitte, Baratariabai pirate, and his mate, Dominick You, who was to lead the expedition to rescue the conquered Frenchman; the Old Absinthe House, built of tiny flat bricks brought in sailing-ships from France, with its stone bar eaten deep by the water-drops of countless dripped absinthes; Congo Square, scene of ancient negro slave Voodoo dances and incantations; the old French Market, whence will come the delicacies of your table; the old French opera-house, first in America, where Adelina Patti made her debut; the "Archbishopric," still inhabited—the oldest original house west of the Alleghanies; the duelling grounds in City Park, where rapiers once flashed beneath the oaks, draped in Spanish moss;—but pages could be filled with what you'll see!

Nor is all historic. You'll see an ancient port, now the greatest and most modern American port next to New York, with grain elevators, cotton warehouses, and Public Belt railroad owned by the city. You'll see 9000-ton steel ocean-going freighters being built inside the city limits.

Should you care to combine with the convention some hunting or fishing or yachting or bathing or golfing—the best in the South is within half an hour of Canal st.

"Southern hospitality" is not a joke or a catchword here. It's a tradition—almost a religion. And it's at your command. Come try it!

Faternally yours,

C. V. VIGNES, *President.*

J. P. WAHL,

Chairman Local Com.

Psi Omega Fraternity.

NEW YORK ALUMNI CHAPTER.

THE twenty-seventh annual banquet of the New York Alumni Chapter of the Psi Omega Fraternity will be held at the Hotel Commodore, 42d st. and Lexington ave., New York City, on Saturday, May 3, 1919, at 6.30 P.M. Every Psi Omega in this vicinity is cordially and fraternally invited to be present to help welcome those of our brothers who have been in the service. Send name and address to

JOHN L. PETERS, *Treasurer,*
133 W. 72d st., New York City.

American Society of Orthodontists.

THE nineteenth annual meeting of the American Society of Orthodontists will be held in St. Louis, Monday, Tuesday, and Wednesday, March 10, 11, and 12, 1919, with headquarters at the Planters Hotel. An excellent program is assured.

F. M. CASTO, *Sec'y,*
Cleveland, Ohio.

Vermont State Dental Society.

THE next annual meeting of the Vermont State Dental Society will be held in Burlington, Vt., March 19, 20, and 21, 1919.

P. E. MELLE, *Sec'y,*
Middlebury, Vt.

District of Columbia Dental Society.

POSTGRADUATE CLINIC AND MANUFACTURERS' EXHIBIT.

THE District of Columbia Dental Society will hold a postgraduate clinic and manufacturers' exhibit at Washington, D. C., March 18, 19, and 20, 1919. The subjects to be considered are root-canal technique, plate work, and bridge work. Clinics will be held on the 19th and 20th at Hotel Harrington, and will be open to subscribers only. Papers will be read on the 18th, 19th, and 20th, at George Washington University, and will be open to all ethical practitioners.

ARTHUR B. CRANE, *President,*
1424 K st., N. W., Washington, D. C.

Missouri State Dental Association.

THE 1919 meeting of the Missouri State Dental Association will be held in the new Hotel Statler, St. Louis, Mo., April 14, 15, and 16, 1919.

A very elaborate program is in preparation, and the St. Louis Dental Society, who will act as hosts, claim that this will be the banner meeting in the state.

The first two days of the meeting will be devoted to clinical instruction in the most advanced phases of modern dental practice, by a competent and experienced teaching staff. The special clinicians and their subjects are—Dr. Justin D. Towner, Memphis, "Periodontia." Dr. George Thompson, Chicago, "Dental Ceramics and Removable Bridges." Dr. Boyd Bogle, Nashville, "Radio-dontia and Oral Surgery." Dr. Gillett Hay-

den, Columbus, "Preventive Dentistry." Dr. S. L. Silverman, Atlanta, "Conductive Anesthesia and Root Resection." Dr. H. A. Maves, Minneapolis, "Crown and Inlay Technique." Dr. Philip R. Thomas, Minneapolis, "Pedodontia."

A general clinic session of individual and group clinics will be given the afternoon of the 16th. Members of the National Dental Association are invited to attend the meeting and contribute to the clinical program.

H. F. D'OENCH, *President*,
1703 S. Grand ave., St. Louis, Mo.

J. F. WALLACE, *Sec'y*,
Canton, Mo.

Illinois State Dental Society.

THE fifty-fifth annual meeting of the Illinois State Dental Society will be held in Peoria, Ill., May 13, 14, 15, and 16, 1919.

J. P. LUTHRINGER, *Sec'y*,
Peoria, Ill.

Connecticut State Dental Association.

THE fifty-fifth annual meeting of the Connecticut State Dental Association will be held in the Chamber of Commerce Assembly Hall, 252 Asylum st., Hartford, Conn., on Tuesday and Wednesday, April 15 and 16, 1919. The program is replete with interesting features, and all members of the National Dental Association are cordially invited to attend.

Further information will be supplied by

MORTON J. LOEB, *Sec'y*,
35 Elm st., New Haven, Conn.

Michigan State Dental Society.

THE sixty-third annual meeting of the Michigan State Dental Society will be held at the Hotel Statler, Detroit, April 7 to 12, 1919.

To meet the demand for dental meetings that *teach*, another postgraduate course, greatly improved and added to, will be put on by the Detroit Dental Clinic Club. All Michigan talent will also make up the general program.

CHALMERS J. LYONS, *President*,
CLARE G. BATES, *Sec'y*,
Durand, Mich.

Texas State Dental Society.

THE thirty-ninth annual convention of the Texas State Dental Society will be held at Waco, Texas, April 21 to 24, 1919.

Several men of national prominence will conduct the postgraduate feature of the meeting, which will supplement the program of papers and clinics by members of the society.

J. G. FIFE, *Sec'y*,
736 Wilson Bldg., Dallas, Texas.

Iowa State Dental Society.

THE annual meeting of the Iowa State Dental Society will be held in Des Moines, Iowa, May 6, 7, and 8, 1919. An interesting program has been arranged. Men from out of the state holding National cards are cordially invited to attend all sessions.

For further information address

E. R. SWANK, *Sec'y*,
C. N. B. Bldg., Des Moines, Iowa.

Northern Ohio Dental Association.

THE Northern Ohio Dental Association meeting will be held in Cleveland, Ohio, Monday, Tuesday, and Wednesday, June 2, 3, and 4, 1919, at the Hotel Statler.

GEO. B. SMITH, *Sec'y*,
Fremont, Ohio.

Kentucky State Dental Association.

JUBILEE MEETING.

THE fiftieth anniversary—"Jubilee meeting"—of the Kentucky State Dental Association will be held in Louisville, Ky., June 9, 10, 11, and 12, 1919.

A postgraduate course of unusual interest has been planned. Address all correspondence to

W. M. RANDALL, *Sec'y*,
Louisville, Ky.

Iowa Board of Examiners.

A SPECIAL meeting of the Iowa State Board of Dental Examiners for the examination of applicants will be held in Iowa City, Iowa, commencing March 10, 1919, at 9 A.M.

For further information address

J. A. WEST, *Sec'y*,
417 Utica Bldg., Des Moines, Iowa.

Dental Society of the State of New York.

THE Dental Society of the State of New York will hold its fifty-first annual meeting June 12, 13, and 14, 1919, at the Hotel Onondaga, Syracuse, N. Y. All ethical dentists residents of New York and those residing in adjoining states are cordially invited to be present at the sessions of the society.

Dr. A. C. Bickelhaupt, City Bank Bldg., Syracuse, N. Y., is chairman of the Exhibits Committee.

A. P. BURKHART, *Sec'y.*

52 Genesee st., Auburn, N. Y.

Rhode Island Board of Registration.

A SPECIAL meeting of the Rhode Island Board of Registration in Dentistry, for the examination of applicants, will be held in Providence, R. I., at the State-house, March 18 to 20, 1919.

For further information address

ERNEST A. CHARBONNEL, *Sec'y.*

334 Westminster st., Providence, R. I.

Massachusetts Board of Examiners.

A MEETING of the Massachusetts Board of Dental Examiners will be held in Boston, Mass., March 17 to 21, inclusive, 1919, for the examination of candidates for registration. All applications must be in the hands of the secretary on or before March 7th. For further information address

GEORGE H. PAYNE, *Sec'y.*

29 Commonwealth ave., Boston.

South Carolina Board of Examiners.

THE next meeting of the South Carolina State Board of Dental Examiners will be held at Bamberg, S. C., commencing promptly at 9 o'clock, Monday morning, June 16, 1919. All applications should be in the hands of the secretary by June 6th.

R. L. SPENCER, *Sec'y.*

Bennettsville, S. C.

New Jersey Board of Registration.

THE State Board of Registration and Examination in Dentistry of New Jersey will hold a special examination in the 2d Regiment Armory, Trenton, N. J., on March 3, 4, 5, 6, and 7, 1919. License fee, \$25; re-examination fee, \$10. Practical tests required: Insertion of an approximal gold filling, with

approximating tooth in position, compound approximal amalgam filling, a silicate filling, practical test of the applicant's ability in oral prophylaxis, and preparation of a cavity for an inlay with wax pattern. Also the soldering of a bridge consisting of three or more teeth exclusive of abutments, and one Richmond crown, which may be one of the abutments of the bridge; these must be struck from dies made from an impression of the mouth, and the articulating model, with the bridge, when soldered, must be submitted for inspection. An anatomical articulation of a full upper and lower set of teeth will also be required; teeth to be furnished by applicant. Wax bite properly trimmed and in place on models for inspection before setting up teeth.

[See quotation from dental law published in February COSMOS, p. 192.]

Note—Dental Radiography will be added to the list of theoretical examinations in June.

JOHN C. FORSYTH, *Sec'y.*

430 E. State st., Trenton, N. J.

Mississippi Board of Examiners.

THE next meeting of the Mississippi State Board of Dental Examiners will be held in the Capitol Building, Jackson, Miss., on the third Tuesday in June. Examinations begin at 8.30 A.M. daily until completion. Fee \$10. Diploma from recognized school and certificate of moral character required. Application blanks and further information can be obtained from

B. J. MARSHALL, *Sec'y.*

6-7 Turner-Cox Bldg., Marks, Miss.

Vermont Board of Examiners.

THE next meeting of the Vermont Board of Dental Examiners, for the examination of candidates to practice in Vermont, will be held at the State-house, Montpelier, commencing at 2 P.M. on June 30, 1919, and continuing for three days.

To be eligible for examinations a candidate must be (1) twenty-one years of age. (2) a graduate of a high school of the first class; and (3) a graduate of a reputable dental college.

Applications must be in the hands of the secretary not later than June 21st.

For further information apply to

HARRY F. HAMILTON, *Sec'y.*

Newport, Vt.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING NOVEMBER 1918.

November 5.

- No. 1,283,505, to FRANK Z. HANSCOM. Bicuspid tooth and backing.
 No. 1,283,859, to HORACIO MIRA. Dental casting machine.

November 12.

- No. 52,645, to HUGO FRIEDMAN. Design for lip retractor.
 No. 52,683, to WESLEY L. SMITH. Design for tooth-repair-material shade guide.
 No. 123,411, to THE ARISTA CORPORATION. Trade-mark for tooth paste or dental cream.
 No. 123,412, to SAMUEL W. ADLER. Trade-mark for dental root-canal instruments.

November 17.

- No. 1,285,273, to AUGUST F. LUZZI. Attachment for dental instruments.
 No. 1,285,360, to ARTHUR C. PETERSON. Tooth.

November 26.

- No. 1,285,758, to THOMAS G. MCMAHON and GUSTAV E. FRITZ. Curved pin for detachable crowns.
 No. 1,285,815, to JOSEPH SIMONS. Toothbrush.
 No. 1,285,896, to MAURICE J. BABE. Articulator.
 No. 1,285,988, to GEO. H. GUDEBROD and EDWARD D. GUDEBROD. Dental floss.

ISSUED DURING DECEMBER 1918.

December 3.

- No. 1,286,881 to ARTHUR W. GRAY. Device for measuring materials for tooth filling.
 No. 123,695, to SAMUEL A. CROCKER Co. Trade-mark for polishing and grinding tool for dentists.
 No. 123,715, to HEIDBRINK Co. Trade-mark for gas-administering machines.
 No. 123,763, to FREDERICK STEARNS & Co. Trade-mark for dentifrice.

December 10.

- No. 1,286,914, to OTTO BARTA. Sterilizer.
 No. 1,287,001, to ROBERT W. GREENBERG. Dental apparatus.
 No. 1,287,149, to WILL P. WALTER and DAVID G. MCCURDY. Anesthetic mask.
 No. 1,287,240, to LOUIS COOPERSTEIN. Interchangeable facing for artificial teeth and backing for the same.
 No. 123,814, to HOPKINS CHEMICAL Co. Trade-mark for tooth paste.
 No. 123,843, to VERNON H. MICHENER. Trade-mark for preparation for the treatment of pyorrhea.

December 17.

- No. 1,287,733, to FREDERICK H. NIES. Dental dam holder.
 No. 1,287,926, to FREDERIC ECAUBERT. Dental cleaning device.
 No. 1,288,349, to OTIS J. WISE. Toothbrush.
 No. 53,766, to LEO D. JACOBY. Design for tongue depressor.

December 24.

- No. 1,288,655, to CHOTOKEE NISHI. Removable bridge attachment.
 No. 1,289,025, to CLAUDE B. WEVER. Holder for toothbrushes and other articles.

December 31.

- No. 1,289,086, to CARL J. BAUMAN. Toothbrush and tumbler rack.
 No. 1,289,325, to CHARLES H. WAKE. Dental instrument.
 No. 1,289,446, to IRA H. GRIFFITHS. Dental powder container and feeder.
 No. 52,826, to THEODORE G. LEWIS. Dental box-flask design.





DR. WM. ANGUS RAY.

THE DENTAL COSMOS

VOL. LXI.

APRIL 1919.

No. 4

ORIGINAL COMMUNICATIONS

Failures and Accidents with Mandibular Injections.

By THEODOR BLUM, D.D.S., M.D. (Univ. Pa.), Universæ Med. Dr. (Vienna),
New York, N. Y.

DIRECTOR, DEPARTMENT OF ORAL SURGERY, NEW YORK THROAT, NOSE, AND LUNG
HOSPITAL; INSTRUCTOR IN SURGERY, NEW YORK POSTGRADUATE
MEDICAL SCHOOL AND HOSPITAL.

(Read before the meeting of the Central Dental Association of Northern New Jersey,
Newark, January 27, 1919.)

DURING the last three years, conduction anesthesia of the jaws by intra-oral injection has been widely employed, not only by the oral surgeon, but also, to a very large extent, by the general dental practitioner. While all the injections at the various foramina are called conduction, the mandibular alone can be looked upon as a true nerve-blocking. All the others owe their success more or less to infiltration, which necessarily takes place, with the possible exception of the infra-orbital, if given according to the method outlined in a previous article on conduction anesthesia.* Beginning with the incisive injection where the surrounding tissues are largely infiltrated, the resulting anes-

thesia is less supported by infiltration in the injections enumerated in the following order: Anterior palatine, tuberosity, mental and infra-orbital. In mandibular injections we therefore find the only true type of nerve-blocking, because the pterygo-mandibular space in which the anesthetizing solution is deposited is at least 2 cm. distant from any region operated upon in the ordinary dental or oral surgical work. The above-mentioned facts make the study of the failures and accidents with this type of conduction anesthesia much more important and interesting.

By failure is meant the lack of anesthesia. This may be due to the faulty manipulation of the solution, needles, or syringes, but in most cases must be attributed to insufficient knowledge of anatomy and neglect to study the proper

* "The Technique of Conduction Anesthesia," *Dental Summary*, February 1915.

technique. The average practitioner can easily and quickly become familiar with the preparation of the solution and the accompanying necessity of asepsis throughout the operation of injecting.

Regarding needles and syringes, the experienced operator will succeed with any instrument recommended for the purpose, but if selected for the beginner and the average practitioner, the heavy steel needle and the small Freienstein syringe (now manufactured in New York) must be given preference. Both long thin steel (Fig. 1, A and B) and iridio-platinum needles are easily bent, and if bent will not inform the operator as to the exact position of the needle point, and therefore permit the depositing of the anesthetizing solution in almost any part but the neighborhood of the inferior dental and lingual nerves. Accidents due to the breaking of last-named needles will be discussed below.

All the syringes usually recommended are larger and heavier (and incidentally more expensive) than the one mentioned above, and therefore are more difficult to handle, and also obstruct the view of the operator. The only disadvantage of the Freienstein syringe is the asbestos plunger, which has to be changed every few months, although if properly handled by a competent nurse these may last a year or more, as is the case with my two office syringes, which have been in use for the past seven years. Leakage at the hub or back-flow in the syringe itself (whether with metal or asbestos plunger) may result in little or no anesthesia. The simplicity of instruments and the logical method of technique make up the secret of success.

IMPORTANCE OF A THOROUGH KNOWLEDGE OF ANATOMY.

The study of anatomy is the most essential foundation. In fact, one may say that the practitioner who knows his anatomy could, without much trouble, work out his own technique. Many misleading statements have been made in different books and articles on conduction anesthesia regarding the anatomy.

Fischer, for instance, outlines in one of his illustrations an area on the buccal side of the mandible which is supplied by the long buccal nerve, but still maintains that it seems unnecessary to anesthetize the long buccal nerve. The long buccal nerve, a branch of the mandibular division of the fifth nerve, being given off just below the foramen ovale, is naturally not anesthetized by an injection into the pterygo-mandibular space. The experienced operator knows that in from 15 to 25 per cent. of all cases of successful mandibular injections, the soft tissues covering the buccal aspect of the mandible in the region of the bicuspid and molar teeth remain unaffected and have to be injected either locally or by a conduction injection of the long buccal nerve, as described by Williger.

It may be mentioned that the lack of knowledge of the anatomy displayed in a large number of articles on conduction anesthesia is appalling. It is quite difficult for the average student to learn the technique of mandibular or any other injection by the study of its description alone, especially because most writers take so much for granted or are not accustomed to teaching or describing a method in minute detail. It may not be out of place, therefore, to describe first the method of mandibular injection used and taught for the last few years, and then explain those parts of the technique which call for it. Before doing this, however, the following paragraph from a previous paper* may be of interest:

In regard to palpation the student must become familiar with the fact that the best palpation can be accomplished with the index finger only, and that this finger must be employed for this purpose in all injections, with the possible occasional exception of the mental. We must learn to palpate gently and carefully without causing the patient the least pain, or even discomfort. We must understand that palpation is successful only if done lightly, as the different types of tissues cannot be distinguished if the palpating finger rests heavily and presses hard upon

* "The Teaching of Conduction Anesthesia," *Journ. N. D. A.*, July 1918.

the underlying parts. The operator must stand a certain distance away from his patient, so that the neighboring joints, like the wrist and elbow, are not acutely bent, but nearly straight and at ease. This is best accomplished by standing in front of the patient, as I believe all operations in conduction anesthesia as well as oral surgery should be performed.

TECHNIQUE OF MANDIBULAR INJECTION.

The technique of a right mandibular injection is as follows:

Place the left index finger with its palmar aspect upon the lower fold of the right vestibule of the mouth. Move this finger back toward the ascending ramus until its tip palpates the external oblique line at its origin from the outer plate of the mandible in the region of the second or third molar, ascending on this external oblique line (the middle of the finger-nail always being in contact with that line) until the palmar aspect of the finger has reached the level of the occlusal surfaces of the lower teeth. Up to now the palmar part of the index finger has been directed only downward. The finger is now so turned as to allow the finger-nail to come in contact with the internal oblique line while the ball of the finger rests in the retromolar triangle. Retracting the finger-nail externally and anteriorly one exposes the point of insertion, which lies in the internal oblique line about 1 cm. above the occlusal surfaces of the lower teeth, and, as a rule, either on the line of the buccal surfaces of the molar teeth or external to it. The region of the point of insertion is painted with tincture of iodine. The syringe (filled with 2 cc. of a 2 per cent. novocain-suprarenin solution prepared with N. S. tablets "E" and mounted with a heavy steel needle) is now grasped with the right hand like a pen, and the needle point (its bevel away from the bone) inserted into the above-mentioned point and the internal oblique line reached by passing through the overlying soft tissues. The needle must now be retracted from the bone to release it from the periosteum, thus enabling one to move it mesially and to pass the in-

ternal oblique line, which brings us into the neighborhood of the lingual nerve, where we inject three or four drops to anesthetize this nerve. The needle point is at present not in contact with the bone. To come in contact with the bone (which is the only absolute and certain guide), the syringe, which up to now has been in a practically sagittal position, is turned toward the opposite side until the needle reaches the bone again (inner aspect of the ascending ramus). The needle is now guided along the inner aspect of the ascending ramus until it has disappeared for about 2 cm. of its length into the soft tissues, when the point will have reached the region of the inferior dental nerve, where we slowly deposit the remaining solution (about $1\frac{1}{2}$ cc.). The withdrawal of the needle completes the injection.

After teaching a large number of students I have come to the conclusion that neglect in complying with any one or all of the requirements of this technique may, in the average case, not only result in failure, but may also, as we shall see later on, be responsible for an accident. To begin the palpation by starting mesially and moving externally to find the internal oblique line is the worst advice yet given in any method. The external oblique line is easily reached and found from the lower fold, and the internal oblique line is easily detected in the average case by following the procedure outlined. There are cases, however, in which the internal oblique line is ill-developed and difficult to palpate, but even so, this line, and with it the point of insertion, can easily be found if one remembers that the point of insertion—besides being 1 cm. above the occlusal surfaces—practically always lies either on the line of the buccal surfaces of the molar teeth or external to it. With the point of insertion well fixed, the palpating index finger tip has to be kept throughout the injection in the same position, namely, slightly retracted from the point of insertion.

The success of the injection depends, among other things, upon a good view of the field of operation. This is readily

obtained by bending the joints of the index finger, which procedure keeps the lip not only retracted, but also pulled externally. The thumb being placed upon the lower border of the mandible and the remaining fingers against the side of the face will steady the head of the patient. One can easily tell if the needle is inserted at the right point, because it will have to pass only a comparatively thin layer of soft tissue to reach the bone. The retracting of the needle after striking the bone is necessary, so as to release it from the periosteum in order to permit thereafter the passing of the internal oblique line, which with the needle point in the periosteum (which is firmly attached to the bone) would be impossible without either injuring this membrane or bending or breaking the needle.

It was pointed out above that the syringe and needle are in the sagittal direction, and that the syringe is only moved toward the opposite side to allow the needle point to come in contact with the bone again (inner aspect of the ascending ramus) after depositing a few drops of the solution in the region of the lingual nerve. The inner aspect of the ascending ramus forms such an angle with the median line that it is practically never necessary to cross the median line at the lower central incisors to allow the needle to slide back along the bone (inner aspect of the ascending ramus).

The mandibular injection is the only one during which we keep the bevel of the needle away from the bone. While no great benefit may be derived from this, we believe it to be logical, as the needle lies between the bone and the two nerves, thus allowing, therefore, the solution to flow directly toward the nerves instead of being directed toward the bone first and then infiltrating the areolar tissue and later the nerves making up the contents of the pterygo-mandibular space.

Lack of success with this anesthesia is often due to the wrong impression which is given to or acquired by students of the anatomical position of the retro-molar (or postmolar) triangle. The

name itself is misleading, creating the impression that this triangle would lie posterior to the molar teeth. The fact is that it lies much more external than posterior; the proper name, therefore, would be postero-external molar triangle. One can readily understand why the student not keeping this fact in mind will direct his needle directly posterior to the last molar tooth, and will with this procedure not only be quite a distance from the lingual and inferior dental nerves, but also will infiltrate the internal pterygoid muscle, with the well-known consequences.

One may also class the impossibility of employing local anesthesia as a failure. To illustrate this point, it may not be out of place to quote from a previous article* the paragraph on "Management of Patients":

While one may be even an expert in every phase of the subject, he may fail on account of his lack of ability in the management of patients. The student must watch the instructor very closely in this part of the work. Children, as well as adults, must be treated individually, one rule not being applicable to all patients. An occasional visitor at times may consider us rough or impolite in handling the patients, but longer observation will teach him, as we were taught by experience, that some patients have to be spoken to very politely and patiently, while with others a stern and resolute manner must be adopted. To some patients you can explain in detail, if necessary, what will be done, while in other cases again it may be advisable to talk as little as possible without seeming to neglect the interest we have for the patient and the work to be accomplished. It requires experience to read and understand each individual, and we must never lose patience to accomplish our task. It is rare that conduction anesthesia cannot be employed on account of the impossibility of managing the patient.

PERCENTAGE OF FAILURES.

In experienced hands, the number of failures will average about 10 per cent. of all cases. By re-injection this number can be still further decreased. Out of

* "The Teaching of Conduction Anesthesia," *Journ. N. D. A.*, July 1918.

all my cases, I can at present recall only one in which three mandibular injections did not accomplish the desired result, and in these infiltration was afterward used with as little effect. Injections for the long buccal nerve will be indicated in approximately 20 per cent. of all cases. One should always look upon these "normal" failures as the result of faulty technique rather than blame anatomical anomalies or idiosyncrasies for his lack of success. Bearing this in mind, the earnest operator is stimulated to further study which will bring him as near the ideal and perfect as is possible, but both the ideal and perfect are as unattainable to the human being as is *mobile perpetuum*. Those men, therefore, who claim 100 per cent. of success are either carried away by their enthusiasm or deliberately withholding the truth.

Pulpal anesthesia of lower teeth is, according to reports from dental practitioners, not very successful, probably even less so than in the maxillæ. No explanation for this has been given so far, although it really seems peculiar that a tooth may be extracted painlessly while its pulp is still sensitive. My experience regarding this subject is given in a previous paper,* from which I cite the following:

We must admit that in some cases we have found it impossible to have pulps of molars removed under mandibular anesthesia. I remember one case distinctly. We gave three mandibular injections for the extirpation of the pulp of a first molar (pulpitis), but the slightest touch of the exposed pulp caused excruciating pain. At the removal of the tooth the patient experienced no pain whatever; it may be said that all symptoms of a successful mandibular anesthesia were present. It has also been observed that contact with the larger nerves, either by pressure or traction, during operations elicited considerable pain, while all the other tissues were completely anesthetized.

The author is not in a position to report an accident which can be attributed

to the action of the solution. A slight discomfort due to nervousness, or syncope, long after the injection, if the patient happens to see an instrument, has occurred occasionally. Many cases, however, with accidents apparently resulting from the solution were reported to me, but whenever they were re-injected, at the hospitals or at my office, no symptoms of pain whatsoever were noticed. Only a few weeks ago, an out-of-town patient called at my office giving the history that five weeks ago a mandibular injection was given, after which the patient was unconscious for about an hour. Upon hearing the history, I advised him, as a precaution, to undergo a complete general medical examination, which proved negative. Later on, the patient was operated on at my office under a mandibular injection for the removal of a first molar and hidden roots of a second molar, and the curetment of a large area of absorption in the apical region, without any trouble whatsoever. There is a possibility that the accident and the consequent failure (the dentist postponed his work on account of the accident) was due to the quick injection of a hot solution.

Furthermore, the author has no case on record where the general condition of the patient prevented the use of conduction anesthesia. It may be well to cite the case of a patient, fifty-two years of age, suffering from coronary artery disease and an accompanying myocardiac degeneration, for whom the roots of a first molar were chiseled out without the slightest ill-effect from the anesthetic.

Having excluded, at least as far as my own hospital and office experience is concerned, accidents or dangers arising from the anesthetizing solution, we shall now consider the most important phase or cause of accidents, namely, the breaking of the needle in the soft tissues making up the covering of the inner aspect of the ascending ramus. Altogether seven cases of broken mandibular needles (Fig. 1) came under my care. It may be of interest to give the histories of the seven cases:

* "Mandibular Anesthesia," DENTAL COSMOS, January 1916.

Report of Seven Accident Cases.

CASE I. H. L. H., male, age forty, private patient; March 31, 1914. Right mandibular

CASE II. I. M., male, age forty-five; private patient; January 25, 1916. Left mandibular injection; long thin steel needle

FIG. 1.

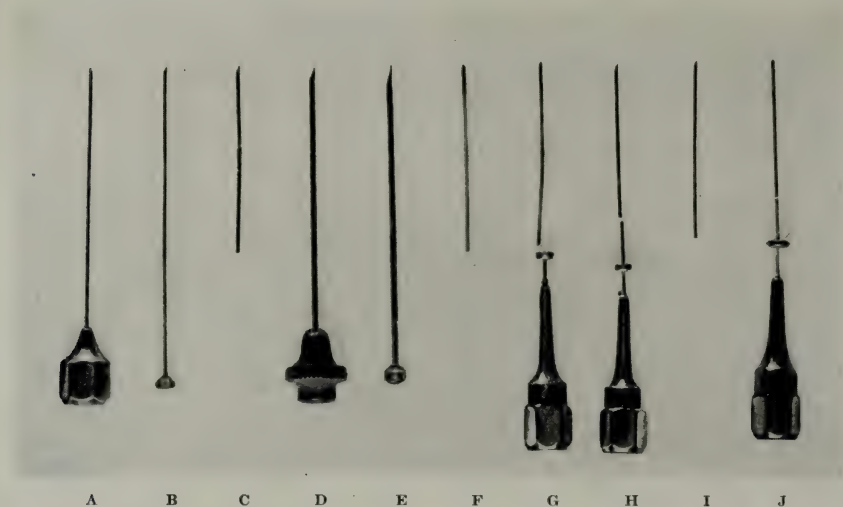


FIG. 2.



injection; record needle. Lateral oblique X-ray plate (Fig. 2). Patient refused operation.

(Fig. 1, c). Fischer's method. Previous attempt at removal. Postero-anterior and lateral X-ray plates (Figs. 3 and 4).

FIG. 3.

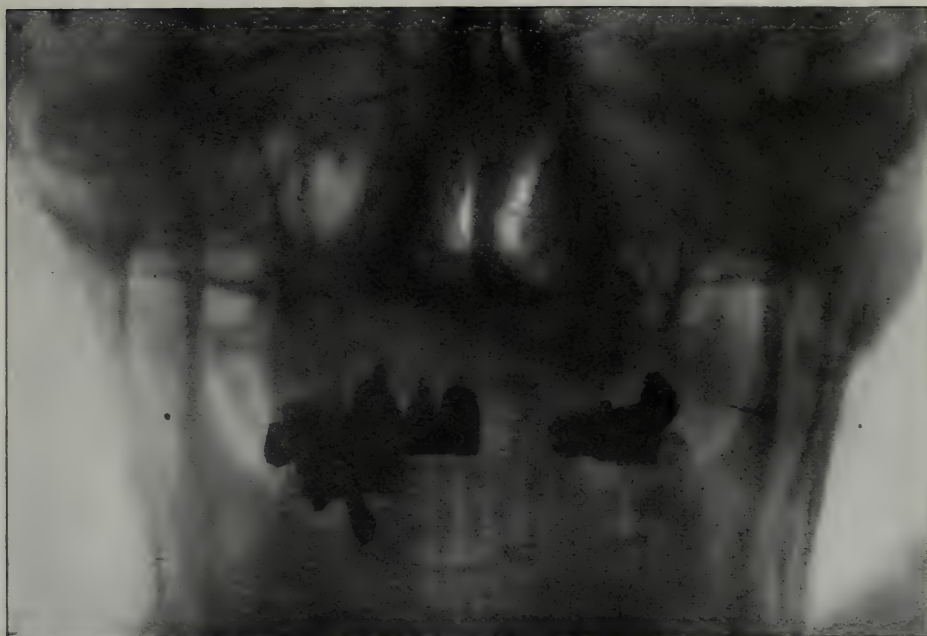


FIG. 4.

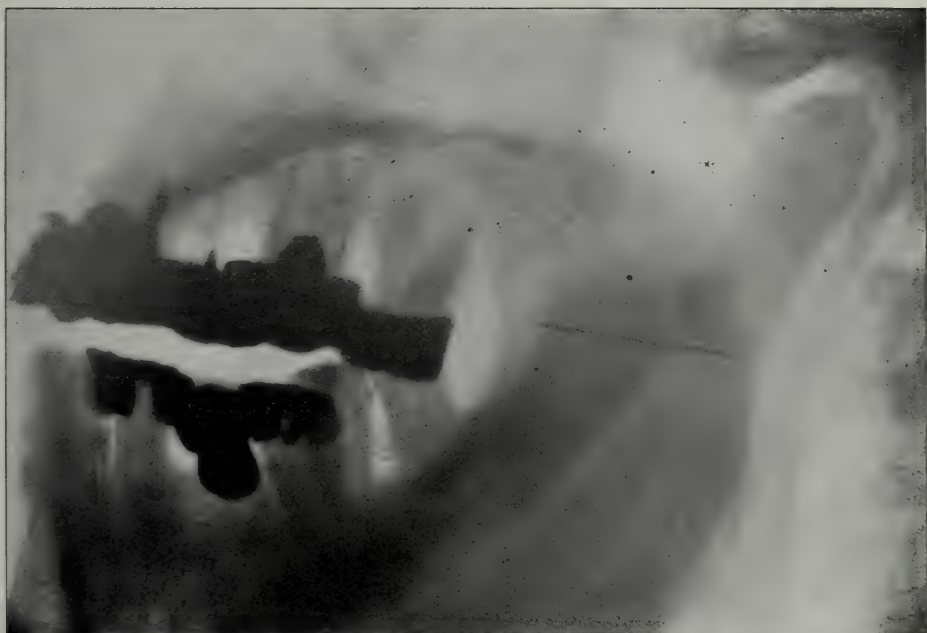


FIG. 5.

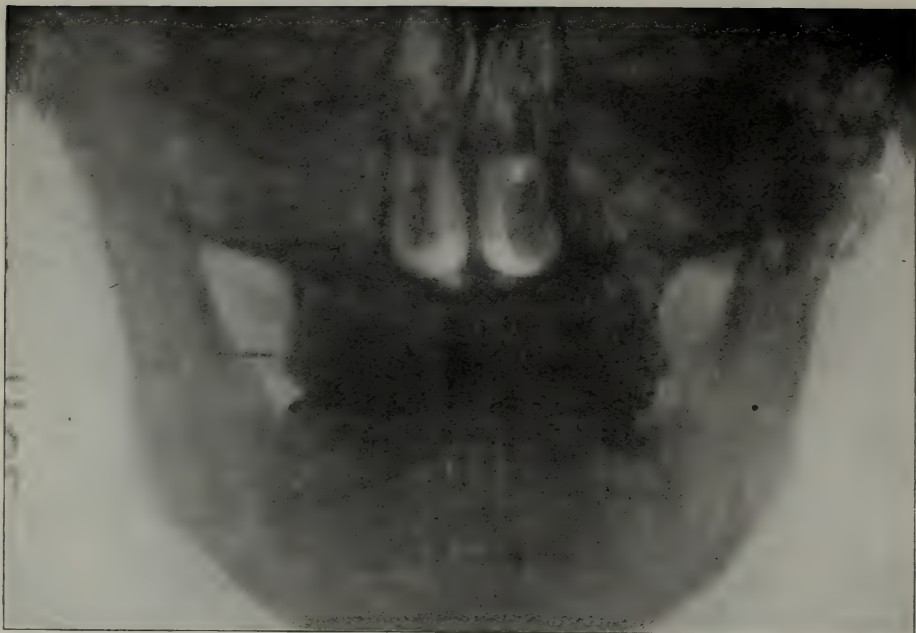


FIG. 6.

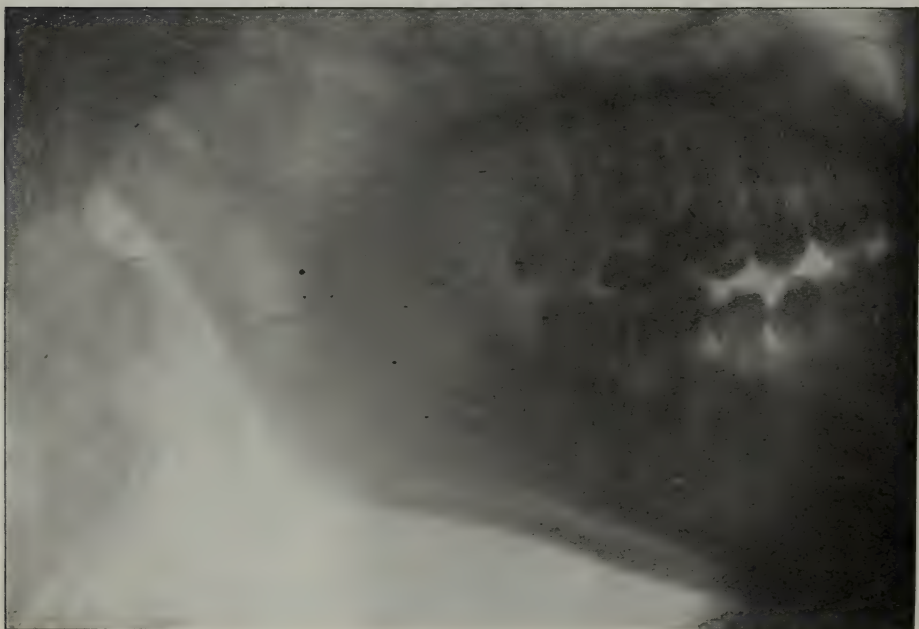


FIG. 7.



FIG. 8.

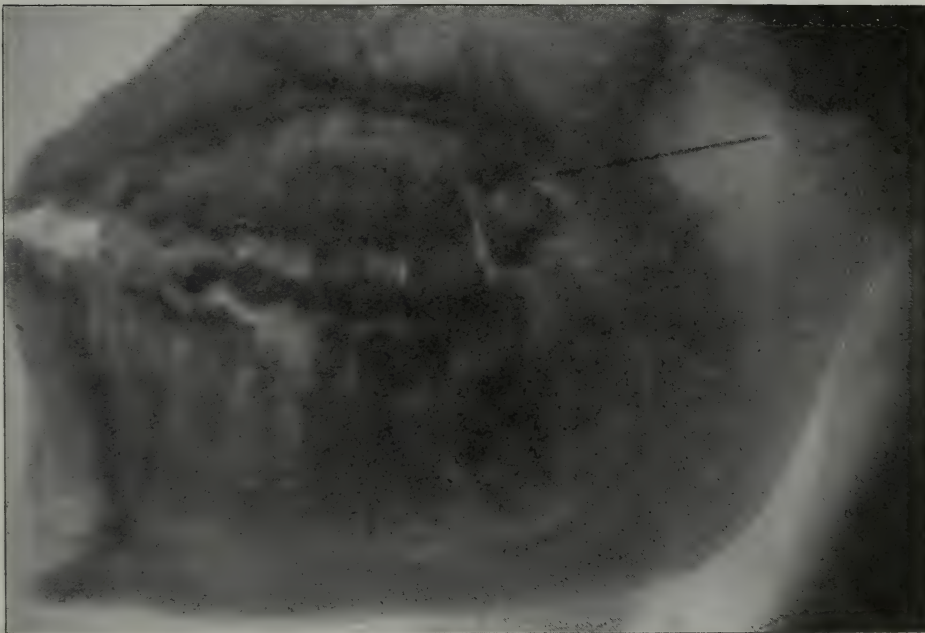


FIG. 9.

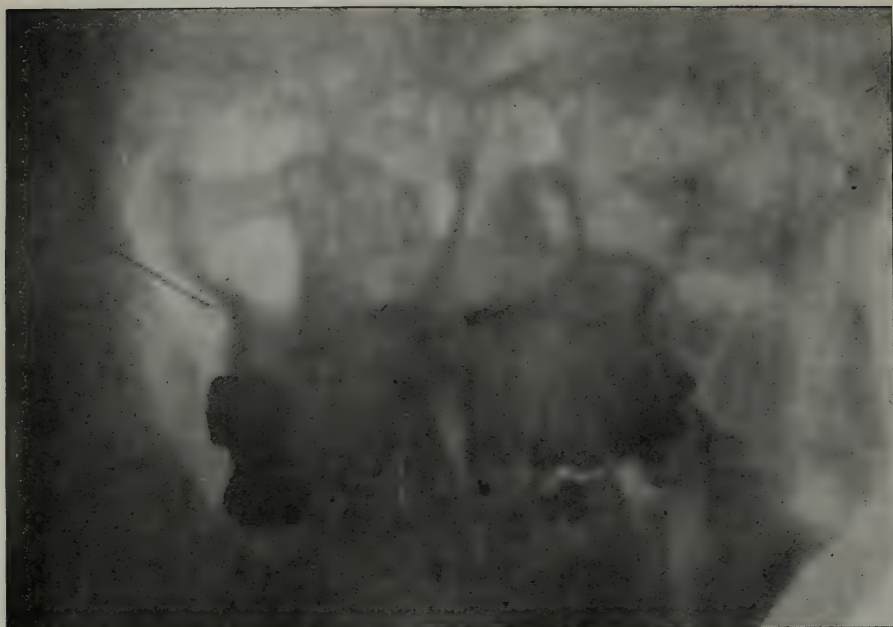


FIG. 10.

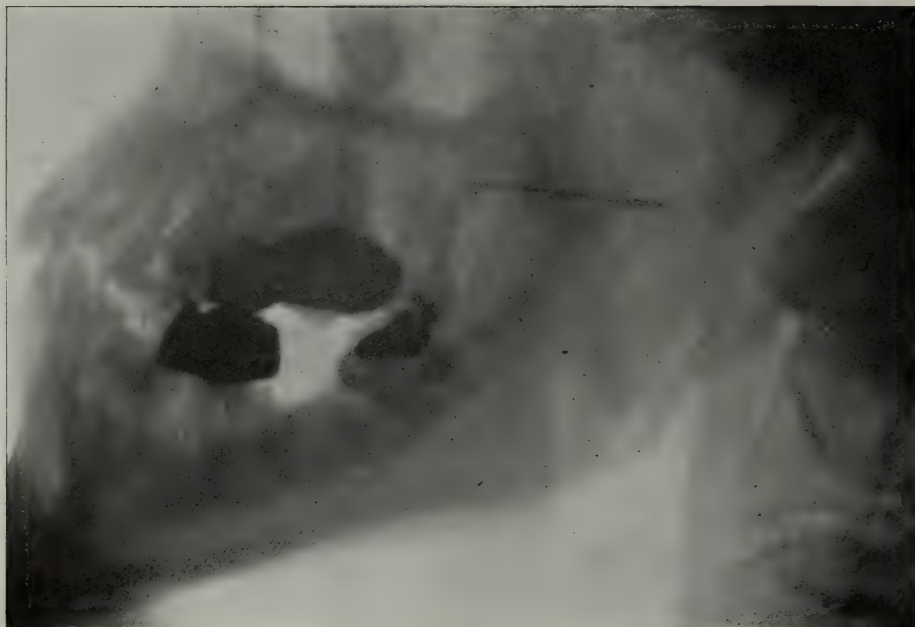


FIG. 11.



FIG. 12.

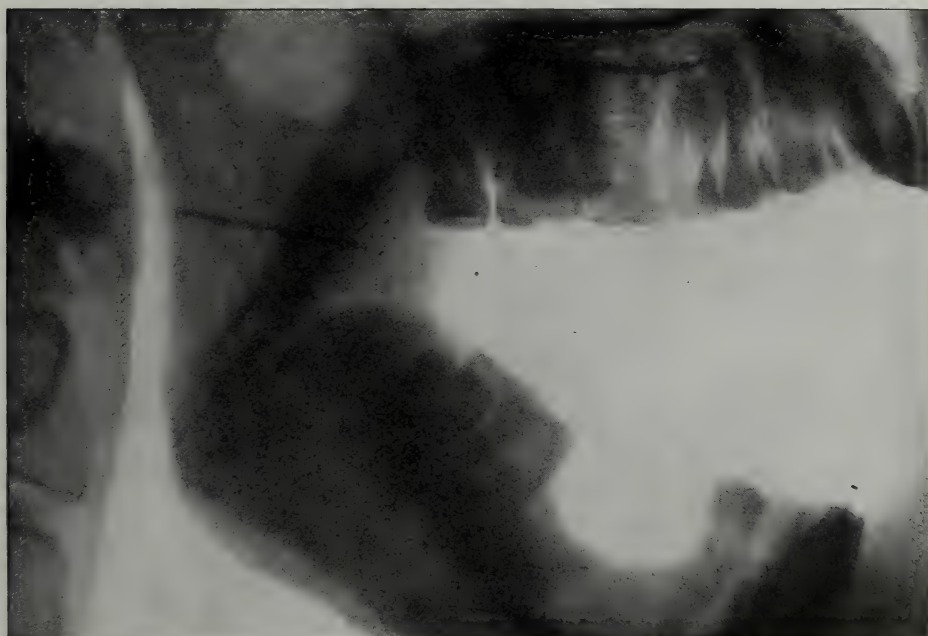
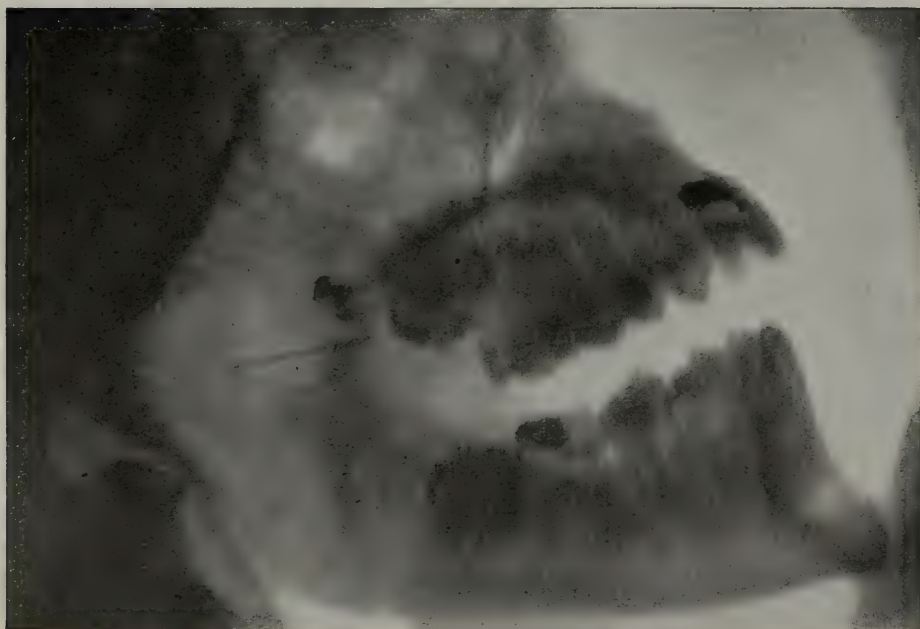


FIG. 13.



FIG. 14.



Dentist's history of case. "On Saturday January 22d I attempted an injection of the left mandible with 2 per cent. solution of novocain, for the devitalization of the first molar and first bicuspid. The needle used was Schimmel No. 17, steel, $1\frac{1}{2}$ in. long. During the injection the patient moved his head to the left quickly, and the needle snapped off at the hub end. On Sunday January 23d I consulted Dr. X. at his office, who cut into the tissues for the removal of the needle, and after probing the area for an hour and a half he decided to take X-ray pictures and remove the needle the following day. On Monday January 24th he again probed the tissues, but failed to locate the needle. As the patient's face was greatly swollen and the pains very severe, the doctor thought the use of the electro-magnet would be the proper thing. After a long journey to the hospital we were refused the use of the magnet, and the doctor wanted to postpone the removal until the next day. I myself became tired of delays, and as the patient was beginning to feel uneasy, I decided to take the case away from the doctor."

Operation (under circumscribed infiltration), January 25, 1916. Treatment from January 26th to March 11th. (Prolonged treatment on account of suppuration.)

CASE III. E. R., female, age eighteen, clinic patient; October 9, 1917. Right mandibular injection; long safety disk steel needle (Fig. 1, F). Fischer's method. No previous attempt at removal. Postero-anterior and lateral X-ray plates (Figs. 5 and 6).

Dentist's history of case. "October 6, 1917. The injection was made for the purpose of extracting a lower right first molar. A long safety-disk steel needle, two inches long, was used in the usual manner. At the termination of the injection the needle broke right below the hub, the broken end disappearing within the soft tissues. The extraction was completed, there being full anesthesia, at that sitting."

Operation (under mandibular and infiltration), October 9, 1917; sutured. October 11th, removed sutures.

CASE IV. F. T., female, age fifteen, clinic patient; December 14, 1917. Left mandibular injection; long thin steel needle (specimen lost). Previous attempt at removal. Postero-anterior and lateral X-ray plates (Figs. 7 and 8).

History: Needle broken about a week before patient came to the hospital. On December 9, 1917, Dr. X. tried for two and a

half hours to remove the needle, without success.

Operation (under ether—unmanageable patient), December 14, 1917. On December 24, 1918, patient came to hospital O. K.

CASE V. A. A. B., male, age twenty-six, clinic patient; March 26, 1918. Left mandibular injection, long safety disk steel needle (Fig. 1, G). Fischer's method. No previous attempt at removal. Postero-anterior and lateral X-ray plates (Figs. 9 and 10).

Operation (under mandibular and infiltration), March 26, 1918; sutured. March 30th, sutures removed.

CASE VI. B. G., male, age forty-six, clinic patient; May 20, 1918. Right mandibular injection; long safety-disk steel needle (Fig. 1, H). No previous attempt at removal. Postero-anterior and lateral plates (Figs. 11 and 12).

Dentist's history of case. "May 20, 1918, Case: Right mandibular. Method of injection: Syringe in right hand and barrel resting on opposite side when inserting needle, following method taught by Dr. X. Used long steel needle with safety disk. I received my first instruction from several lectures and demonstrations by Dr. X., followed by readings from current periodicals."

Operation (under mandibular and infiltration), May 20, 1918; sutured. May 24th, sutures removed. December 24th, patient came to hospital O. K.

CASE VII. H. C., female, age ten, clinic patient; August 13, 1918. Right mandibular injection; long safety disk steel needle (Fig. 1, I). Fischer's method. No previous attempt at removal. Postero-anterior and lateral X-ray plates (Figs. 13 and 14).

Operation (under mandibular and infiltration), August 13, 1918; sutured. August 17th, sutures removed.

METHODS AND INSTRUMENTS USED IN THE ACCIDENT CASES.

In studying the histories of these cases, two striking features are quite apparent, namely, that in five cases Fischer's method of mandibular injection was employed, and in four cases the long thin safety-disk steel needle was used. This only proves again my previous contention that for the average practitioner Fischer's method should not be the method of choice. To palpate the internal oblique line with the finger-nail of

the index finger and then proceed to the pterygo-mandibular space without first striking the internal oblique line with the needle point, is erroneous to my mind, because even the experienced operator at times finds difficulty in palpating the internal oblique line with the finger alone, but must confirm his findings by striking this line with the needle point as outlined in the method described above.

Regarding the use of different needles, one can easily appreciate that the long heavy steel needle (Fig. 1, D and E) should be preferred. I have never seen nor heard of a case in which such a needle was broken, while with all others, including the iridio-platinum ones, such accidents have occurred. It may be true that the first prick of the needle when going through the mucous membrane is more painful, but its advantages (it does not bend and has never been broken) far outweigh this single disadvantage. In April 1917 I reported* the following in regard to the safety-disk needle and syringe (novocain hypodermic outfit of Farbwerke-Hoechst Co.):

So far both syringe and needles have stood the test. It seems that the needle bends at the distal part of the disk, and repeated straightening may weaken it considerably. The syringe is smaller and lighter than the so-called Fischer syringe. It is very easily handled and satisfactory in every way. We hope that unimportant defects which may be found at any time will be simple to remedy.

The average operator employing the safety-disk needle believes that it cannot break except between hub and disk. From past experience I personally believe that the addition of the safety disk weakens the needle above the disk. Considering the vast number of mandibular injections given daily by many practitioners, it may seem ridiculous to speak about these few accidents, but if one has witnessed the anxiety of the dentist in such cases, and has seen the state of mind of the patient (if the patient is aware of the accident), it must be ad-

mitted that even one case is just one too many.

So far, one may say, these accidents are due to the instruments used and the technique employed. But in reading over the history of case II, one will notice the following sentence: "During the injection the patient moved his head to the left quickly, and the needle snapped off at the hub end." It is very important to remember that both the needle and syringe should form one straight line. This will give the needle a chance to bend if the patient happens to turn his head, even though quickly. In this case the needle was probably bent—in other words, needle and syringe did not form a straight line—when the sudden motion of the head caused the additional bending which resulted in the breaking of the needle.

In looking over the X-rays of the seven cases one finds a postero-anterior plate and a lateral plate of all except the first case, which only shows a lateral oblique X-ray, as if we were examining the body and ascending ramus of the mandible, and not as though we were endeavoring to get an idea of the relation between the needle and the ascending ramus. To locate a foreign body, two plates at right angles must be taken to enable the operator to determine the relation of the foreign body to the surrounding tissues. Stereoscopic examination would probably answer the purpose in a way, although it would be difficult to examine stereoscopic plates during an operation, while it is simple to study the postero-anterior and lateral plates on the illuminating box.

If the method of mandibular injection described above is used, the syringe is practically always in a nearly sagittal direction, and therefore the needle on the postero-anterior plate would appear much shorter. Only on Fig. 3 does the needle appear short, but in this case the attempts to remove it may have put it in such a position as to bring it in close contact with the inner aspect of the ascending ramus. There is one thing which stands out prominently after studying all the other X-rays, namely,

* "Notes on Conduction Anesthesia," *Journ. N. D. A.*, October 1917.

FIG. 15.

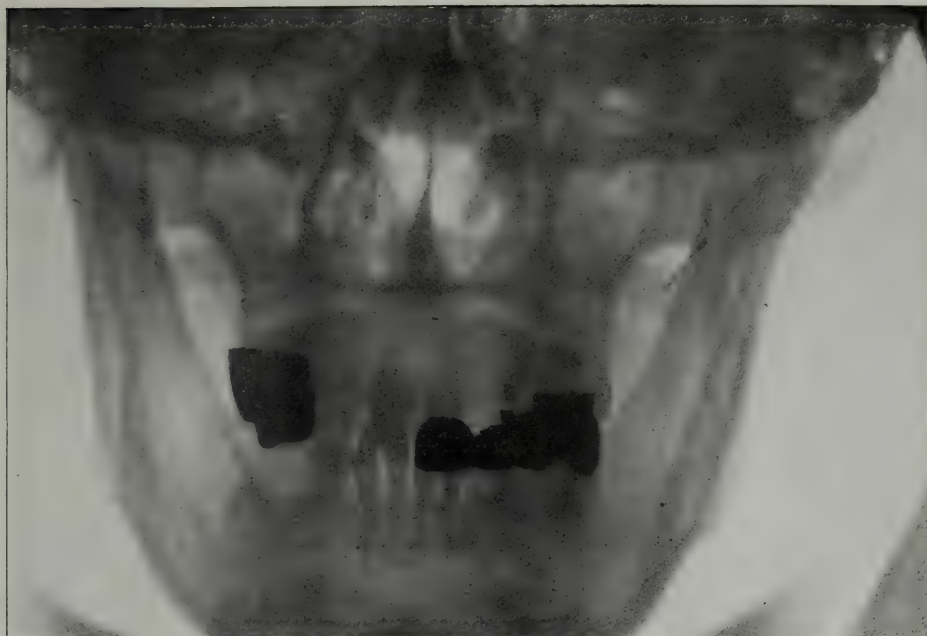


FIG. 16.

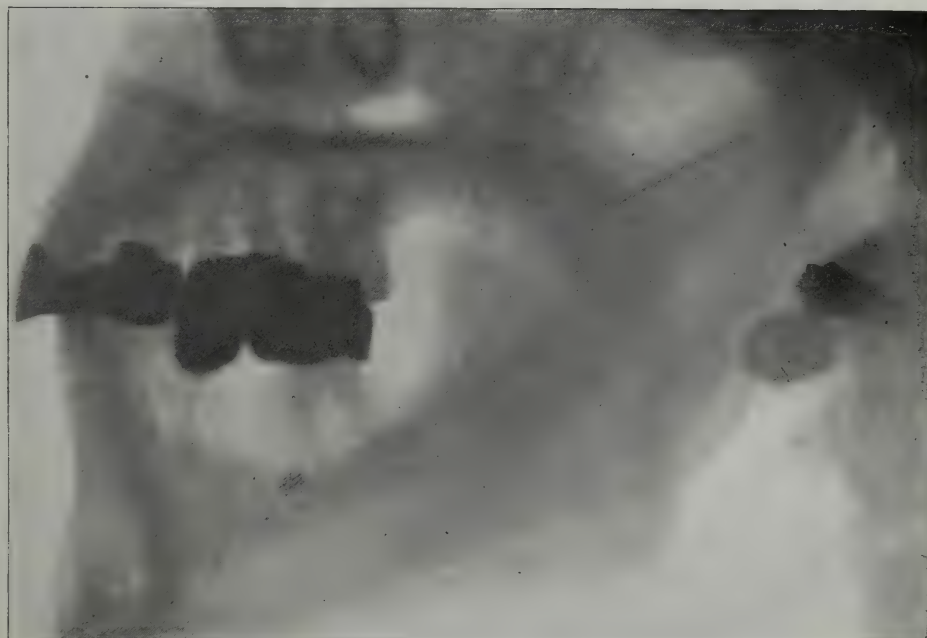


FIG. 17.

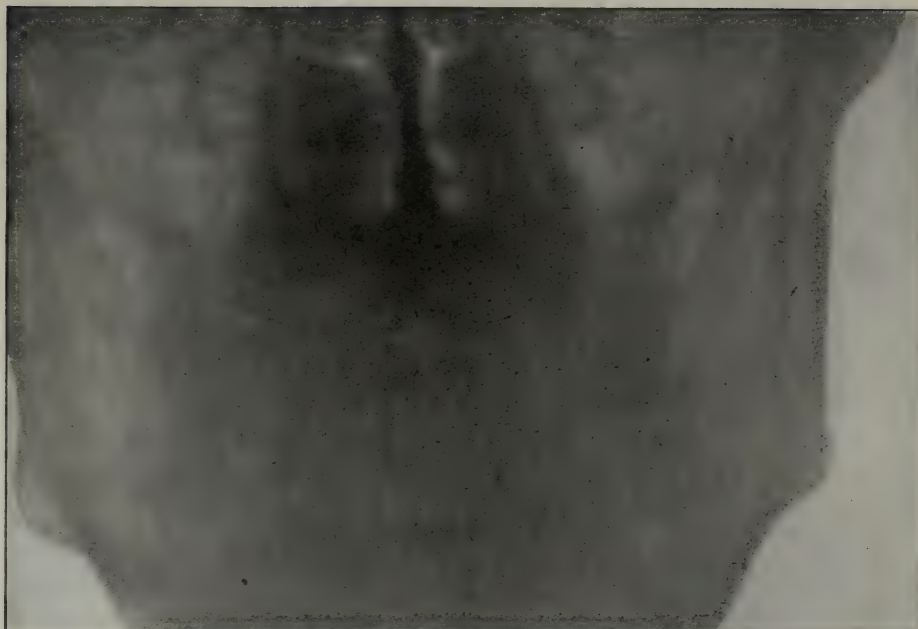


FIG. 18.



that in no case do we find on the lateral plate the needle in its normal position, i.e. 1 cm. above and parallel to the occlusal surfaces of the lower molars. We find it too high or too low, pointing upward or downward, even reaching the posterior border of the ascending ramus or directed so high as to nearly suggest that a tuberosity injection may have been attempted.

Additional Recent Cases.

CASE VIII. L. G., female, age forty, private patient; January 27, 1919. Left mandibular injection; long thin steel needle. Fischer's method. No previous attempt at removal. Postero-anterior and lateral X-ray plates (Figs. 15 and 16).

Dentist's history of case. "January 18, 1919. Injection by Fischer method, injecting while the syringe rests upon bicuspid of opposite side, syringe in right hand, palpating with left. Steel needle, no safety disk, used once before, the same afternoon, for a posterior tuberosity, therefore practically new. No difficulty was experienced on insertion; did not strike hard against bone, in fact I had already emptied the syringe and was in the act of withdrawing it when the patient, who is of a nervous disposition, turned her head, or rather jerked it, snapping the needle. I went ahead and removed the bicuspid, having perfect anesthesia. I thought I could obtain hold of the needle, and in so trying may have sent it upward."

Operation (under circumscribed infiltration), January 27, 1919. Treatment from January 28th to February 8th.

CASE IX. A. G., male, age twenty-nine, clinic patient; February 21, 1919. Left mandibular injection; long thin steel needle. Previous attempt at removal. Postero-anterior and lateral X-ray plates (Figs. 17 and 18).

Dentist's history of case. "February 26, 1919. The needle was a steel one, mounted in a long hub, exposing sufficient needle to reach the area desired. The technique used by my operator was the cross-hand technique, as this was a left side case. I do not personally approve of this method, since I believe that one loses his sense of direction on a left mandibular injected with right hand. The needle was thin and had no safety hub. At the moment of the accident, my assistant claims, the needle was inserted up to the hub, the barrel being on the other side of the median line in the bicuspid region, but not resting upon the teeth. Half of the

contents had been discharged when the patient suddenly started and the needle disappeared."

Operation (under circumscribed infiltration), February 21, 1919.

CONCLUDING REMARKS.

In operating on these cases, one should remember that an incision must be made at a right angle to and at about the middle of the needle; that an infiltration will be necessary besides the mandibular injection to assure a bloodless field; that the operator is not in a position to boast beforehand just how long it will take him to remove the foreign body; that one must have patience and a good knowledge of the anatomy surrounding the foreign body. A great many cases can be sutured. No one should attempt to remove a needle unless he is perfectly familiar not only with the parts to be operated upon, but also with the surgical technique.

The percentage of failures and accidents with mandibular injections is comparatively small. Knowing the causes, the number of cases can be reduced to a minimum. A good teacher and a good student make up the combination which will eliminate to a large extent such unpleasant experiences as are dealt with in this paper.

What are the requisite qualifications for a good teacher? He must first of all be a good student himself and have a thorough knowledge of the subject in its minutest detail; he must also possess the faculty of comprehensively teaching by lecture, demonstration, and actual work; he must be patient, and must be free from any influence of the manufacturers of drugs or instruments. On the other hand, the student must have confidence in the ability of his teacher and be willing to be taught, also to forget, one may say, during the time of instruction, any knowledge he may have gained previously. Having studied and practiced different methods, he is placed in a position to select the best of each for the benefit of his patient and for his own success. It is worth while to educate oneself properly in this subject, because

conduction anesthesia, and especially the mandibular injection, is the greatest step forward made in dental and oral surgery

during this century, being a blessing both to the patient and the surgeon.

140 WEST 57TH ST.

The Treatment of the Army Dental Patient.

By Capt. JOHN T. ASHTON, Dental Corps, U. S. Army.

HAVING served as a dental officer in the U. S. army since July 24, 1917, two months at a base hospital at one of the large Southern training-camps, and eight months with infantry regiments in the same camp, and the balance of the time, up to and including the present, as division dental surgeon with an overseas division, I have had ample time and opportunity to observe the dental work done in the army by reserve corps officers, and I wish therefore to say a few things in regard to it.

There is of necessity a difference in the dental work in civil life and in the army, and many men who came into the service from well-equipped offices, leaving behind lucrative practices which they had spent much time in building up, found many conditions confronting them that seemed absolutely impossible to cope with. The student just out of college—and there were many of them—found things quite different from what he had so recently been taught, and he was really the worse handicapped of the two, for he lacked the experience and the knowledge that comes, not from the textbooks and the classroom, but from practical experience, which tells one at a glance what to do and how to do it.

Much has been written on the subject of the army dentist, and that individual has generally suffered therefrom—so much so that the general impression has been conveyed that the soldier was unfortunate when he was in need of the services of a dentist. These things, I

think, have been written by thoughtless men, and without any thought of the consequences. I have in mind two cases particularly—one an article that appeared a few months ago in *Oral Hygiene*, by a writer who says that his "idea of soldiering is not to give up a good practice for the rough-and-tumble dentistry of the army, largely made up of cement and amalgam fillings"—and I will have more to say to him farther on—and another writing some time ago in the *Journal of the Association of Military Dental Surgeons*, who says that "85 per cent. of the army extractions can be accomplished without any anesthetic." The editor of the latter journal, I am glad to say, rebuked the author when the article was published.

Regardless of the differences in the equipment in our private offices and that found when we come into the army, and the restrictions to certain kinds of work, principally cement and amalgam, there is absolutely no excuse for any difference in the treatment of the patients in the two places. The private of the army is entitled to and should receive just as much courtesy and professional skill as Mrs. Van So-and-so, who drives up to our private office at home in a handsome car with footman in livery and who is one of our best patients. We have no more right, because the Government of the United States puts bars on our shoulders and gives us a certain amount of authority, to extract the teeth of the soldier without an anesthetic than we have to do the same thing in our office

at home; and if we practiced that method at home we should not be able to practice very long.

We dentists who have been given the opportunity to enter the army—I may say, who have been given the opportunity to give up our large practices at home and get out and see the crying need for dentistry!—should be thankful for the chance, and take every advantage of it. The army of today is made up of men from every state, even every little town and hamlet, in the U. S. A., from every stratum of life—from the homes of the rich, the well-to-do, and the poor; and every army organization at the present time has its share of all classes, rubbing elbows with each other every day.

No dental officer can practice in the army without coming into contact with all of these, and he has the opportunity of seeing beautiful oral cavities, wonderful restorations, examples of the work of the best men in the profession today, and examples of the worst; and last, but most important to him, he sees those who have never had the services of a dentist before—some because the patient did not choose it, and others because they never had the opportunity. Hence he is here given the chance to spread the doctrines of good dentistry and oral hygiene among the masses as he never would have had at home; and the man who has failed to use this chance has not been loyal to his profession or his country. This has not only brought his profession to the fore in the minds of a large number of men, but if he has done his duty at this time he should have no fear of his future in civil practice.

The impression that prevails in civil life, among dentists as well as civilians, that “The forceps is the main article of equipment of the army dentist,” and that “it is used indiscriminately,” should and must be dispelled. Less extraction is probably done in the army today than in the offices of civil dentists, and for a very good reason, in that we in the army are handicapped to a large extent in facilities for replacing with dentures and bridge work teeth lost from extraction, and therefore many teeth that

would be sacrificed in civil life for the sake of a bridge or plate are saved by the army dentist. When extraction is necessary, however, everything is done to prevent pain and infection; the syringe and forceps are boiled, the gums and necks of the teeth are painted with solutions of iodine, the anesthetic (generally novocain) is made with distilled water, and the sockets are antiseptically treated after the operation. I know this to be a fact in my division, and I believe it is the universal practice in the army. Of course there have been times at the actual front, in the first line trenches under fire, when it was impossible to carry out the above procedure to the letter, but even here every precaution has been taken.

With regard to “amalgam and cement fillings,” I would ask the author of the article in *Oral Hygiene* already referred to if he knows of any other two materials employed in dentistry that have a more universal use or that save more teeth than amalgam and cement and the combinations of the two? When I say amalgam fillings, I do not refer to a sloppy mass of alloy and mercury pushed into a cavity with the finger and smoothed off with a wet piece of cotton, but to a well-triturated mix of a balanced alloy and standard mercury (such as the army provides), thoroughly amalgamated in a glass mortar and pestle, applied to a standard cavity in a mouth protected by cotton rolls and napkins, and introduced piece by piece and packed with Woodson pluggers, carved for occlusion, and nearly always polished. That is the kind of amalgam filling that the army requires and it is the kind the soldier gets, and many of the dentists just out of college who went into the army have perfected their amalgam technique to a point far beyond that of the civilian dentist in many cases. The cements used are of the best, as Caulk's, S. S. White's, and Lee S. Smith's; and while cement fillings are not recommended, they are at times the only fillings that can be used to preserve the teeth and avoid extraction.

The army also is equipped with very

good laboratories (even in the field), where good plate and bridge work are done if the necessity arises "in line of duty." The army patients are given thorough examinations periodically, and at these examinations every man in the command is examined and classified into two groups, A and B. Class A comprises those with clean mouths showing no subgingival calculus or marked salivary deposits, the teeth being free from major caries, periodontal pockets, and suspected or known periapical infections; not having root remnants or impacted teeth. Class B: Those with subgingival calculus or marked salivary deposits, dental caries extending into the pulp chamber, suspected or known periapical infections, and marked periodontal pockets, or having root remnants or impacted molars. Does the average practitioner in civil life subject his patients to such a rigid examination?

These men are then sent for by squads—class B first—and their mouths cleaned up, by removing all calculus and roots; periodontal infections and pyorrheal pockets are treated, and all necessary work done to put them in class A. Then class A men are sent for, and all minor cavities are filled—until whole regiments are in perfect condition as far as the oral cavity is concerned. Lectures are given

them from time to time on the necessity of clean mouths, on the cleaning of the teeth after each meal and before retiring, on the importance of visiting a dentist at the first sign of decay, and instructing them in the proper use of the toothbrush.

I do not for an instant mean to say that all that is preached to them is practiced as it should be—for there are many things which occur in the life of a soldier, especially in France, which prohibit it; but I do say unhesitatingly that there are men in the army today who are cleaning their teeth who never cleaned them before, and that these men will return to civil life with a new conception of dentistry; that they will remember the lessons we have taught them and never again neglect their teeth as in the past. What they have learned in the army they will spread among their families and friends at home, and the dentists in civil life who "do not care to soldier as a rough-and-tumble army dentist" will probably be the ones to profit by all of this work that we have done in the army; but I for one am satisfied and feel repaid for the loss of time and money in the last two years, to say nothing of the broken home ties, if through it all I have been able to further my profession one step.

Myristica (Nutmeg) in the Treatment of Pyorrhea Associated with the Parasitic Endamœba.

By JOSEPH LEIDY, M.D., Philadelphia, Pa.

RECENT experiments with *Myristica* (nutmeg) in the treatment of amœbic dysentery due to *Endamœba histolytica* has justified the writer in suggesting its use in the treatment of pyorrhea attended with endamœbæ in the secretions and in scrapings from the seat of infection.

Whether in amœbic dysentery it acts as an amœbicide, or by changing the character of the intestinal secretions and thus interfering with the growth and development of the organism, has not been determined. No experiments *in vitro* have been instituted to subject its action to rigid tests, but clinically we are justified in indorsing the use of the drug in those cases of the asthenic type which preclude the use of emetin. The results* are more than encouraging; patients after an interval of four months present no evidence of the parasite in either the motile or cystic form.

Recently it has been found that the use of nutmeg (grated) containing the volatile oil (care being taken to select a pure product) administered in 30-grain doses—the patient being directed to

chew thoroughly and swallow without the addition of water—has resulted in very gratifying changes in the appearance of the gums, lessening the discharge, tightening the teeth and rendering the secretions and the scrapings from about the soft parts free from any form of amœba.

Experiments which have been going on for the past two months justify us in the belief that we have in nutmeg a preparation well worthy of trial. The drug should be taken after meals, the third or last dose being taken before retiring, allowing the preparation to remain in contact with the gums during the sleeping hours, the treatment thus being both local and constitutional.

The volatile oil of nutmeg is a powerful irritant, narcotic, and carminative, and like many of the essential oils, bactericidal. The percentage of volatile oil in the average nutmeg weighing 60 to 75 grains varies from 4 to 8.

For adults, 30 grains of the grated nutmeg is an average dose, and may be used with impunity.

The duration of treatment should be extended from two to three weeks, during which time microscopic examinations should be made at frequent intervals.

* A "Report of *Myristica* (Nutmeg) in the Treatment of Amœbic Dysentery" will appear in an early issue of the *New York Medical Record*, by permission of the Surgeon-general.

Erythrophlein Hydrochlorid as an Agent for Devitalizing the Dental Pulp.

By NORMAN BLACK, L.D.S.Eng., Broughty Ferry, Scotland,

LECTURER IN DENTAL SURGERY, UNIVERSITY OF ST. ANDREWS.

I AM under the impression that no previous writer has described the particular property of erythrophlein with which this article deals. The drug is one which, for some strange reason, is little used. Textbooks on dental surgery make little or no reference to it, and Martindale and Westcott, in one of the recent editions of the extra Pharmacopeia, directly state that "The drug has no central direct action on the dental pulp." This is far from being correct, as for a good many years I have been using erythrophlein as a wonderfully speedy and painless pulp devitalizer.

Since Mummery has demonstrated the direct connection between the dentinal fibril and the pulp, it would now be fatuous to imagine that any drug having a real, deep obtundent effect upon sensitive dentin could be employed without danger to the pulp. It was, indeed, due to reasoning of this sort that the devitalizing action of the drug was discovered and used. A case of sensitive dentin had been treated with throphleol for a few hours, and on the removal of the dressing the desensitization was so very marked that death of the pulp was suspected. With a sharp spearhead bur the pulp was exposed, and removed, without sensation.

Erythrophlein, sassy bark, casca bark, or ordeal bark, is the bark of *Erythrophleum guineense*. The hydrochlorid occurs in yellowish white granular crystals easily soluble in water. The drug has a powerful effect on the heart, similar to the continued action of digitalis and picrotoxin. It is used in doses of

from $\frac{1}{40}$ th to $\frac{1}{20}$ th grain in valvular diseases and dropsy. Erythrophlein is described as an almost ideal drug for the treatment of sensitive dentin. For this purpose it is used in the form of a preparation known as throphleol, consisting of a 50 per cent. solution of erythrophlein in eugenol. This is the preparation which I have made use of for pulp devitalization. Its action is startling in its rapidity, and usually free from anything more than the merest suggestion of pain. Whatever the future may bring in the matter of increased use of erythrophlein as a devitalizing agent, one thing is certain—it is an addition to the armamentarium of the conservative operator. From some five years' personal experience of its usefulness, I am bold enough to say it is an addition not to be despised.

INDICATIONS AND TECHNIQUE.

Whatever the favorite method of devitalization of the individual operator may be, there are three classes of cases in which the use of erythrophlein may be justified—indeed, I think, indicated. They are:

(A) Shallow cavities which have produced considerable pain, and therefore call for devitalization.

(B) Pulp requiring destruction in the mouths of patients so sensitive that they will permit no operative measures until the tooth is free of sensation.

(C) Where drug devitalization must be accomplished speedily.

(D) Devitalization in mouths where other methods have proved unfortunate.

The technique of the employment of erythrophlein for the devitalization of pulps is similar to that carried out when arsenic is the drug used.

With a weak warm alkaline antiseptic, wash away all débris.

With sharp instruments cut away as much carious dentin as can be removed without causing pain. Do not specially seek to expose the pulp. Isolate the tooth, and dehydrate it with chloroform. With warm air evaporate all moisture, and the cavity is ready for the application.

Take an extremely tiny pellet of cotton- (as small as can be conveniently handled in dressing tweezers), dip it in throphleol and apply to the center of the floor of the cavity. A mere smear of the drug on the floor will act quite efficiently and is best in very shallow cavities.

Do not apply the dressing direct to the exposure if it is an old one, but rather to the dentin at a little distance from the exposed spot.

Seal in the dressing carefully with a watertight temporary filling, such as one of temporary gutta-percha or calxin. Leave the dressing *in situ* for forty-eight hours, and then proceed as after devitalization by any other method.

COMPARISON WITH OTHER DRUGS.

In endeavoring to understand the action of this drug, I have for comparison studied what modern authorities say as to the action of the other drugs used to devitalize dental pulps by means of their poisonous action upon them. Bennett, in his "Science and Practice of Dental Surgery," says: "The pulp may be devitalized by, or with the aid of—(a) surgery, (b) poisons, (c) anesthetics;" and later, under poisons, says:

Arsenic devitalizes the pulp by congestion or strangulation. It has been held in many long and cleverly written articles that arsenic caused the death of the pulp by creating an

irritation which stopped or hindered the circulation in the veins. It has been as vehemently held that arsenic causes pulps to die by irritating tissues until so much blood is forced into the pulp cavity through the fine foramen that the return circulation is cut off and the pulp is thus strangulated.

In shorter terms, the arsenic is presumed to act by passive congestion and stasis in the first case, and by active hyperemia followed by strangulation in the other. In order to find out the action of erythrophlein on the pulp, the condition of the organ when under its influence was compared with that of pulps acted on by arsenic.

Whatever the actual process by which arsenic devitalizes, examination of a pulp during the action of the drug certainly shows it to be engorged with blood. If one drills into a pulp only partly devitalized by arsenic, it is amazing how much blood can come from so small an organ.

On the contrary, whatever stage of the process of devitalization by erythrophlein hydrochlorid is taken, the pulp will be found more anemic than normal. Twenty-four to forty-eight hours after its exhibition, in a favorable case, the pulp is usually a white bloodless thread. Later it is noticeable that the pulp is softer, more friable, and more shrunken, than in arsenical devitalization; indeed, in many cases it seems almost to be partially dissolved.

Obviously, here is a very different action from that of arsenic, and with all humility, and willingness for my theory to be disproved, I suggest a possible explanation.

The poisonous action of erythrophlein hydrochlorid on the pulp appears to me to be opposite to that of arsenic. The latter determines an excessive flow to or congestion of the pulp, while erythrophlein hydrochlorid works out the destruction of the pulp by denying it its blood supply. If asked for any analogous pathological state, I would suggest the starving of the peripheral tissues in Raynaud's disease, in which spasm of the arterioles due to morbid action of vaso-

motor nerves causes death of the parts affected.

I find that in the general use of the drug it is said to have internally an action comparable to the combined action of digitalis and picrotoxin. As digitalis is a depressant, and picrotoxin checks nervous action by preventing the stimulation of nervous mechanism, it might be feasible to suggest in support of my theory that the drug which is said to act like a combination of the two as above mentioned, in topical application may depress the vitality of the pulp, and interfere with the nervous mechanism which determines the flow of blood to that organ.

Bearing in mind that the action is as satisfactory when the application is made far away from the pulp as when the drug is placed near to it, the further suggestion is that it has a special and rapid action on nerve and nerve-like tissues. If, then, Mr. Mummery's description of the passage of nerve filaments from the plexus of Raschkow in the pulp into the tubules of the dentin be accepted as proved, the rapidity of action of our drug (through the dentinal fibril to the pulp) is explained. In all these suggestions I beg to be considered as a blind seeker after facts rather than one laying down a didactic statement.

I have for a couple of sessions in my lectures to dental students of St. Andrews University, included erythrophlein hydrochlorid in the list of drugs used to devitalize the dental pulp. In speaking of it I compare its speed of action to that of an express train, and that of arsenic to a horse omnibus. I have hoped by so doing to interest the students in its use and so have the knowledge of its action increased by their added experiences. Increase of knowledge in that way is but slow, and I am emboldened now to approach the great arena of advanced dental thought with this new idea, in the hope that it may be of much use, and that a fuller understanding of it may the sooner be arrived at.

CERTAIN FEATURES OF ITS ACTION.

The two outstanding features of the use of this drug for devitalization are: (a) *The speed of its action*, and (b) *the minuteness of the dosage*.

All speed is comparative, and so I should state that in my experience the average time required for complete action of an arsenical dressing is seven days. To bring about the same result erythrophlein hydrochlorid requires about thirty-six hours.

As regards minuteness of dosage, on one occasion I applied to a superficial cavity a tiny smear of throphleol. In order not to affect adhesion of my temporary filling I removed with cotton all of the throphleol that could be rubbed off. Complete devitalization resulted in the usual time.

I do not wish to suggest that I have not had failures or painful action with this drug. We all know that there are conditions of the pulp, and idiosyncrasies of patients, which nullify successful arsenical action. I should say roughly that the action of throphleol shadows that of arsenic in these cases. I have a patient who has always suffered intense pain with arsenical dressings, and in his case devitalization is slow. The action of throphleol in his case is slower than usual, and accompanied by neuralgia, and I now invariably extirpate pulps for him under an injected local anesthetic. Similarly, chronically inflamed pulps react less satisfactorily to throphleol than those unaffected by degenerative changes.

Still, over all, I am impressed by the wonderfully speedy, painless action of the drug, and strongly recommend all operators to test its worth for themselves, remembering that it is a very powerful drug, and therefore to be handled with caution and respect.

The only warning I have heard sounded is that contained in Martindale that after forty-eight hours' exhibition slight pericemental inflammation may occur. This I have noticed but very rarely, and in very slight degree.

The Dentist and the Recent Influenza Epidemic.

By LEON HARRIS, M.D., D.D.S., Brooklyn, N. Y.

UNDER the name of "la grippe," influenza has for years been almost a household word among English-speaking people. There is hardly any one living today who has not, during some part of his life, had an attack of la grippe, and paid no more attention to it than to an ordinary cold in the nose. Even statistically, and when occurring in epidemic form, the mortality from influenza shows no alarming features, being only about 0.1 per cent. among the military, and 0.5 per cent. among the civilian population, half of the mortality being due to pneumonia. (Osler.)

But the influenza with which the above statistics deal is not the scourge which under the name of "Spanish influenza" has of late ravaged the world.

From time to time there have been epidemics of influenza which, starting sporadically in certain locations, were within a short time carried all over the world. Such epidemics occurred in 1830-33, 1836-7, 1847-8, 1889-90. Bacteriologically, the cause of true influenza is most frequently due to a bacillus discovered by Pfeiffer in 1892 and usually found in the secretions of the nose and bronchi, especially the latter. Culturally, it grows only in the presence of hemoglobin. So much for true influenza, *i.e.* influenza due to the Pfeiffer bacillus. Of course there are types of influenza brought about by other causative micro-organisms, such as streptococcus, staphylococcus, pneumococcus, and the bacillus of Friedländer, causing the same symptoms, and appearing even in severer forms; but, strictly speaking, true influenza, or *Influenza vera*, as it is called, is due to the Pfeiffer bacillus.

Now, with this knowledge in mind,

let us take a short survey of the recent epidemic that has scourged the world, and carried off almost as many victims as has the great war just come to an end. I might say that never has there been a scourge that has been so universal, so death-dealing, so formidable to the best ages in human life (from twenty to forty years), so baffling to the medical profession. Physicians simply throw up their hands in unconcealed impotence, and watch the deadliest of all diseases pluck one here, one there, one yonder, of the sturdiest of their patients without even giving them a fighting chance.

From the bacteriological standpoint a more interesting picture presents itself. While the disease is known to the laity as "influenza," we are here dealing not with a true influenza due to the Pfeiffer bacillus, except in a small percentage of cases, but mostly to a streptococcal infection of the respiratory tract, usually of the hemorrhagic variety. Consequently the term "hemorrhagic streptococcal septicemia" would more correctly express the symptom-complex, both bacteriologically and pathologically. Studies of the secretions from the nose, naso-pharynx, washed bronchial secretions, and from the exudates from the bronchi and lungs at post-mortem have shown a variety of organisms, in which hemolytic streptococci were isolated in 43 per cent. of the cases. Numerous strains of the streptococcus viridans were found. ("Influenza," Nuzim *et al.*, *Journ. A. M. A.*, November 9, 1918.)

The pneumococcus is also found in a great number of cases, but those who have studied the disease are more or less agreed that the streptococcus hemolyt-

icus and viridans at least share with it equally the etiological responsibility. Lieut.-col. Irons, M.C., U.S.A., and Captain Blanton, M.C., U.S.A. (*Journ. A. M. A.*, December 15, 1918) examined the sputum of 740 pneumonia patients, with the result that the pneumococcus was found in 191 cases, streptococcus in 451, and the influenza organism in only 38. In the autopsies of 280 fatal cases which were studied bacteriologically the pneumococcus was found in 78, the streptococcus in 142, and the influenza bacillus in only 8 cases.

In view of these facts, showing the predominance of the streptococcus in the etiology of influenza and pneumonia, the dentist's responsibility assumes a greater scope. Of all the organisms in the range of bacteriology, the dentist is especially familiar with the streptococcus; especially is the streptococcus viridans well known to him. We seldom hear of periapical infection but what the streptococcus viridans comes to mind. Moreover, it is well known that the streptococcus viridans may be either quiescent or hyperactive and capable of transmutations into other and more virulent types of micro-organisms, but at no time is it completely innocuous. Of its ravages in distant organs due to the absorption of toxins we are all convinced, and assume a goodly share of responsibility, especially where it can be traced in its relationship to faulty root-canal technique.

But here looms up a new danger which puts the dentist more on the defensive. If a goodly number of influenza cases are due to the streptococcus, and these in turn are introduced into the organism either by faulty root-canal work or by putrescent teeth that have never come under the dentist's care, our responsibility to our patients becomes more direct and of a graver nature. Whereas in cases that ultimately lead to rheumatism, with endocarditis and concomitant sequelæ, our connection in the matter is so long deferred that responsibility must be carried back to ten, fifteen, or twenty years, carrying with it almost absolution for our sins, we have here a morbid state

that acts without undue loss of time and with unerring aim. The method of attack may be either the more direct one by which the organism directly migrates into the respiratory tract, inflicting immediate injury or death, or there may be the more insidious method whereby the organisms gradually wear down our methods of resistance and defense.

Let me be misunderstood, I wish to say emphatically that I am not here endeavoring to burden the dentist with any more responsibility than is now already weighing him down. The load is heavy enough without adding to it. There are undoubtedly hundreds of thousands of cases that have succumbed to this fatal malady, several of which are personally known to the writer, that had perfect teeth, with not a single devitalization. But just as truly is it a fact that other hundreds of thousands of cases have had their resistance undermined by pyorrheal pockets and blind abscesses, which did not leave them a fighting chance. And here is where the onus falls heavily upon the dentist.

Let us remember that nothing is known to the medical profession that enables him to cure the disease. In almost all of the instances where the physician is called in to treat a case of the "Spanish flu" his relationship to the patient is almost entirely spiritual, simply leaving the latter with the satisfaction that "they called in a doctor." Nobody knows this better than the physician himself, and the frightful toll of the flower of humanity that this disease has exacted bears terrible testimony to this horrid fact. At best the treatment is symptomatic, and consists in the relief of symptoms, the reduction of fever, the alleviation of splitting headaches, the relief of rasping coughs and the keeping open of the channels of excretion. Here and there he uses mixed vaccines, a procedure of doubtful value, resembling the shotgun prescriptions of bygone days, hoping that if one vaccine does not do the trick, another may.

The decisive battle, however, is fought out between the germ and the host. On the constitutional fortifications of the

latter depends the final outcome. And here is where "prevention" looms up stronger than ever, and where the burden of responsibility falls with equal weight upon the dentist and the physician. It would be futile and unfair to place a greater share of this responsibility upon the dentist than he deserves. The mouth is simply one of the channels of infection; the teeth, of which let us remember there are thirty-two in the human mouth, are other channels of infection; the nose and throat, which are

outside of our province, the middle ear, the urinary, gastro-intestinal, biliary, and appendiceal tracts are other and very important channels. These latter must be looked after by the physician, but the oral cavity is pre-eminently our domain, and here we share the responsibility. Unless we learn to eliminate infection from this source, our burden will become ever larger and larger, and our conscience ever more nagging.

236 CARROLL ST.

The Passing of the Mucous Patch and Its Congeners.

By G. FRANK LYDSTON, M.D., Chicago, Ill.,

FORMERLY PROFESSOR OF GENITO-URINARY SURGERY AND SYPHILOLOGY IN THE MEDICAL
DEPARTMENT OF THE STATE UNIVERSITY OF ILLINOIS.

THE syphilitic mucous patch and such lesions as mucous ulcers are of quite as much importance to the dentist as they are to the physician—of more importance in a way, because of the danger of transferring syphilis from diseased to healthy persons through the medium of infected fingers or instruments. The majority of cases of "syphilis insontium"—infection of the innocent—originate in the diseased mouth. Practically all cases which may be attributed to dental manipulations may be charged up to the mucous patch or its congeners—mucous fissures, abrasions, and ulcers.

Aside from dental operation, infection in this disease is transmitted in many ways, such as kissing, or through such media as eating- and drinking-utensils, pipes, cigars, etc. An instance comes to my mind of the infection of a number of glassblowers who in passing the blow-pipe from mouth to mouth were infected by a brother workman afflicted with syphilis and suffering from mucous patches in his mouth.

The facility with which the mucous

patch conveys infection is explained not only by the numerous opportunities for contact of the secretion from the mouth lesions of syphilis with the mucosa of healthy, and therefore susceptible, persons, but also by the extreme virulence of the secretion itself. The secretion of a chancre may not show the germ of syphilis—the *Spirochæta pallida*—but it is rare that the secretion of a true mucous patch does not contain the specific organism.

Until recent years it was my experience that very few indeed of my patients were not annoyed to a greater or less extent by lesions of the mouth, tongue, or pharynx. I was wont to say to each new patient suffering from early syphilis who applied for treatment: "If you are faithful and conscientious in submitting to treatment, you probably will escape all noticeable manifestations of the disease save some falling of the hair and a certain number and degree of severity of sores in your mouth or throat."

For some years past I have been impressed with the rarity of mucous lesions

in my patients, and at first thought I was inclined to attribute this fact to the use of salvarsan. I soon discovered, however, that those who took little or no salvarsan also were relatively immune from mucous lesions. It has seemed to make little difference whether the patient took a maximum or a minimum amount of salvarsan, with or without mercury, or was given mercury alone; the result has been the same so far as immunity to mucous lesions is concerned. To my astonishment, even those patients who break faith with me and indulge in tobacco, no longer pay the penalty of mucous patches to the extent they formerly did. This point is very suggestive in the light of my former experience.

Recalling the effects of mercury upon the mucous membranes of the mouth, and the suspicion I always entertained that our remedies were responsible for mucous lesions more often than was syphilis, the explanation of the relative immunity enjoyed by my patients in more recent years appears simple enough.

In the days when mercury was so freely given by the mouth, the frequency

of mucous lesions apparently was due to the irritation and the associated digestive derangements produced by the drug in the gastro-intestinal tract. In these modern times the drug is given chiefly intra-muscularly, thus avoiding gastro-intestinal irritation. The old idea, that the lesions produced in the mouth by mercury were due entirely to the elimination of the drug by the saliva, probably was incorrect in a measure, because elimination via the salivary glands likewise must occur when mercury is administered intra-muscularly. The obvious criticism that the drug is administered in much smaller aggregate quantities by the newer method, I will freely admit, has some weight, but to me it is not a sufficient explanation.

It would be unfortunate if anything I have said should make either dentist or physician less cautious in his efforts to prevent infection of the innocent. Be it remembered that a mucous lesion may be so small that it neither annoys the patient nor is observed by the physician, and yet produces an extremely dangerous secretion, loaded with the treponema.

25 E. WASHINGTON ST.

Novocain Infiltration Anesthesia in the Everyday Practice of Dentistry.

By H. M. BECK, D.D.S., Wilkes-Barre, Pa.

IT would be very interesting to take a vote of the members of our National Dental Association in order to ascertain what that representative body of the profession considers the three greatest advancements made in our profession during the past twenty-five years. The answer would probably be: Casting, the X-ray, and novocain anesthesia. The majority vote would probably place these three great helps to the profession in the order mentioned.

After years' experience with all three, I am of the opinion that novocain will do more for the advancement of dentistry and for the relief of suffering humanity than either casting or the X-ray. At a demonstration of novocain anesthesia given at a recent dental convention, I was surprised to find that only about 10 per cent. of the men present were using novocain in any form. A careful investigation revealed the fact that the rank and file of the profession look upon novocain as a dangerous drug to handle; that a special course in anatomy is absolutely necessary before the operator can expect to get results, and that after acquiring the anatomical and technical knowledge, an expensive armamentarium is necessary to enable the operator to prepare and inject the drug properly.

Most writers on the subject display a beautiful picture of their armamentarium, the principal effect of which seems to be to convince the dentist who must practice economy that the use of novocain is not for him.

We are told that only 10 per cent. of the people of this country employ the

dentist for any professional service except extracting. This statement must be true when we find that there are only 44,000 dentists to care for the teeth of one hundred million people. Of the people who require the services of a dentist and do not present themselves for treatment, 50 per cent. are kept away from the dental office by the fear of the pain they know they will have to suffer at the hands of the operator. They would willingly pay a good fee if the work could be accomplished with little or no pain. Our profession has certainly put the fear of dentistry into the hearts of the public, and it will take years of careful treatment and much tact on our part to regain the confidence we have lost. With the proper use of novocain, dental work can be made free from pain, and operations which formerly were a great strain and tax upon the nervous energy of both operator and patient can be accomplished quickly and thoroughly, without leaving both patient and operator in a state of nervous collapse.

Novocain was first introduced into this country by Dr. Hermann Prinz in 1907, and in 1912 it was again demonstrated by Dr. Guido Fischer, at which time the dental profession began the study and use of novocain. Owing to faulty technique there were many failures, but when the drug was properly prepared and properly injected the results were so gratifying that the men who were using it carefully and intelligently realized that the advent of "painless dentistry" was near at hand.

It is not the object of this paper to take up the preparation of the solution

nor the technique for nerve-blocking. In the *DENTAL COSMOS* for January 1916 Dr. Theodor Blum, in a most interesting and instructive paper on "Mandibular Anesthesia," has described the anatomy and technique for nerve-blocking. In *Dental Items of Interest* for May 1917, page 321, Dr. C. Edmund Kells' paper entitled "Novocain-Suprarenin" describes explicitly the proper preparation of the drug. Dr. Guido Fischer, in his book "Local Anesthesia in Dentistry," translated by R. H. Riethmueller, has given an instructive, readable, scientific discourse on novocain-suprarenin. The papers mentioned and the book by Fischer have been of great value and assistance to me in my study of novocain.

SOME DISADVANTAGES OF NERVE-BLOCKING FOR USE IN EVERYDAY PRACTICE.

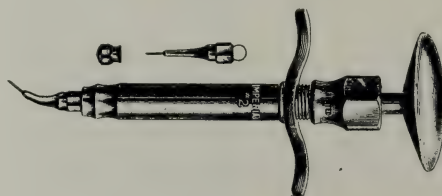
For two years I followed the nerve-blocking method in my practice for extractions, cavity preparation, removal of pulps, etc. Under this method the operations were painless, but my records show that the anesthesia lasted from three to twenty-four hours, and many of the patients found this prolonged anesthesia so annoying that they preferred the pain of the operation to the injection of novocain.

There is still another great disadvantage in nerve-blocking. My records show that on an average it requires twenty minutes to obtain sufficient anesthesia by nerve-blocking to insure a painless operation, and the loss of time in the course of a month was so great that an extensive use of the drug in this manner was not practicable. I then took up the study of infiltration anesthesia, which resulted in the development of a method of procedure which has been highly satisfactory to me and to my patients.

After trying the various syringes on the market, I found that the Imperial syringe No. 2 was the most satisfactory. (See Fig. 1.) An all-glass syringe would be ideal if one could be found that would not leak under slight pressure.

So much depends on the syringe that I wish to lay special emphasis upon the fact that success is impossible unless the syringe is kept sterile and in perfect working order. No operation in the mouth is so dependent upon aseptic conditions as novocain injection, and most failures and deplorable after-effects can be traced to careless preparation of the

FIG. 1.



drug or the use of a syringe which has not been sterilized.

INFILTRATION ANESTHESIA TECHNIQUE.

In nerve-blocking the solution is usually injected at body temperature, about 98° F. With the infiltration method I find that the best results are obtained if the novocain is injected at a temperature of from 125° to 135° F. My first infiltration operations were made with a 2 per cent. solution of novocain-suprarenin, using the E tablets, but experiments soon proved that I could reduce the solution to 1 per cent. and get perfectly satisfactory results in many cases. I would recommend a 1 per cent. solution for children up to sixteen years of age, and also for adults who have a high or low blood pressure and for patients who are recovering from influenza.

Before making the injection I always spray the mouth and throat with a modified Dobell's solution:

Carbolic acid,	m15.
Soda bicarbonate,	51.
Soda diborate,	51.
Glycerin,	51.
Distilled water, q.s. to make	58.

My next step is to wipe the area in which I am going to make the injection with a

70 per cent. solution of alcohol and follow this with Gearhart's mixture:

Carbolic acid,	fl5j.
Tr. iodin,	fl5ij.
Tr. aconite,	fl5iij.
Glycerin,	fl5iv. M.

It has been my experience that we court disaster if we rub or scrub the delicate mucous membrane with iodin or any other powerful antiseptic with caustic properties.

Fig. 2 shows the correct position for holding the hypodermic syringe in fol-

FIG. 2.



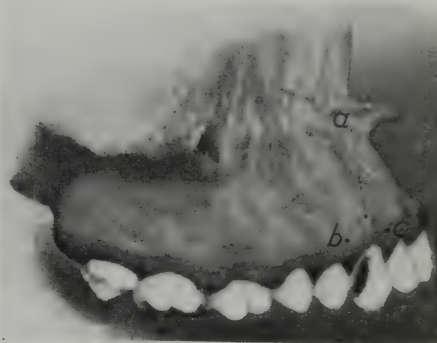
lowing the infiltration method of anesthesia. In nerve-blocking the syringe is held like a pen, but in infiltration injections I find it a great advantage to hold the syringe as in the illustration, for the following reasons: The syringe is under perfect control and the thumb is in position to discharge the solution, necessitating merely the point of the needle entering the tissue. The first drops of the solution are then injected, making the balance of the injection a painless operation. If the syringe is held like a pen the point of the needle must be well seated in the tissue, or in dropping the thumb back to discharge the solution the slight movement of the hand

often withdraws the point of the needle from the tissue, making another puncture necessary and causing more or less pain in what is supposed to be a painless operation.

MAKING THE INJECTION.

We are now ready for our first injection. (Fig. 3.) As an example we shall take a simple case of a painful cavity in the superior right cuspid. The first injection is made in the soft mucosa (Fig. 3, *a*) with a 26 mm. No. 30 gage Schimmel needle. The needle is introduced into the soft tissue just far enough

FIG. 3.



to bury the point, and a few drops of the solution injected to anesthetize the superficial tissues. The needle is advanced slowly, injecting the solution as we proceed until we have arrived in the region of the apex of the root of the tooth—slightly beyond, if possible—then the balance of the solution is discharged, making about $1\frac{1}{2}$ cc. in all. This injection properly and correctly made should take two minutes, and should be painless. After withdrawing the needle, the injected area is massaged for about ten seconds; using very slight pressure. Now, with another syringe and a short needle, make injections at *b* and *c*. Inject slowly and do not use force. For the last two injections $1\frac{1}{2}$ cc. of the solution is used, making 3 cc. for all three injections.

The time required for the three injec-

tions has been about four minutes. The tooth is now anesthetized and ready for immediate cavity preparation. The region injected will remain anesthetized for about one-half hour, and will return to normal conditions in about one hour.

Fig. 4 shows three cervical margin cavities. The preparation of cavities of this character has always been a source of great annoyance to the operator and extremely painful to the patient. Four injections will desensitize all of these cavities and permit their painless excavation at one sitting. The first and second injections are made in soft mucosa (*a* and *b*), the third and fourth injections in hard tissue (*c* and *d*).

FIG. 4.

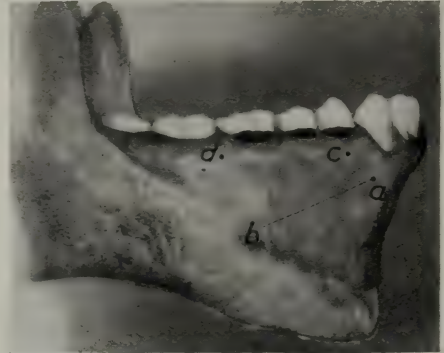


Some writers make the statement that infiltration anesthesia in the mandible is impracticable. I find that with a hot solution of novocain I can get perfect results, in the lower jaw, in all the teeth anterior to the second molars, and in many cases I have had perfect results not only in the lower first molar but also in the second and third molars.

Fig. 5 shows three cervical cavities in the lower first molar and the first and second bicuspsids. For the first injection, using a 26 mm. No. 30 gage Schimmel needle, introduce the needle into the soft mucosa at arrow-point marked *a*, inject a few drops of the solution, advance the needle slowly, injecting the solution as we proceed to the point marked *b*. After withdrawing the needle, massage

the tissues slightly. The amount of solution used for this first injection is $1\frac{1}{2}$ cc. With the other syringe, make injections *c* and *d*, using about 1 cc. of the solution for the two latter injections.

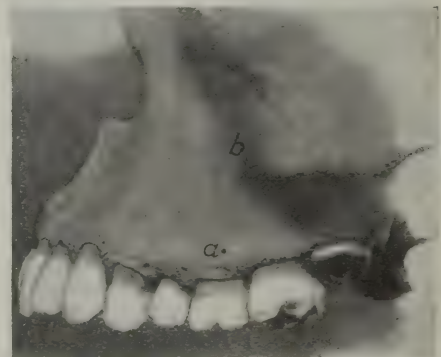
FIG. 5.



Test the cavities, and if they are not quite free from pain, make a fourth injection lingually, corresponding exactly with the injection *a* to *b*, using 1 cc. of the solution.

In making the injection from *a* to *b*, if resistance is met with, do not force

FIG. 6.



the needle. Never use force. Withdraw the needle and start at a slightly different angle, and if resistance is still met with make two injections instead of one. Many operators are of the opinion that the needle must go under the periosteum

before the solution is injected, or the desired results will not be obtained. To in any way injure the periosteum in making an infiltration injection is faulty technique. It is not only unnecessary, but it is a practice that can and should be avoided.

Following the epidemic of influenza we have had a number of antrum cases, and I suppose the same condition prevailed all over the country. Antrum patients are usually very nervous and hypersensitive to pain. I have used novocain-suprarenin with splendid results in all of the cases that have come into my hands, opening into the antrum with a surgical bur, the patients assuring me that they felt no pain at all. Two injections are made with a 26 mm. needle, using $1\frac{1}{2}$ cc. of a hot novocain solution for each injection.

Introduce the needle at point marked *a*, Fig. 6. Inject a few drops of the solution, advance the needle slowly, injecting the solution as you proceed to the point marked *b*. Refill the syringe and make the same injection lingually.

Any drug that will produce anesthesia when introduced into the tissue is more or less dangerous, and consequently should be used with care and judgment. It is my practice to always give the patient a mild heart stimulant before injecting the novocain solution, viz, aromatic spirits of ammonia—adult dose, a half-teaspoonful in water; children, ten to fifteen drops. Nervous patients will sometimes show disquieting symptoms after an injection, as rapid pulse, pallor, perspiration, but such cases are rare.

The most simple and effective antidote is to have the patient bend over and drop the head between the knees, as low as possible. (Fig. 7.) This quickly relieves the brain anemia, fills the blood-vessels, and restores the patient to normal without the use of drugs.

In closing, I wish to state that it is not the object of this paper to discredit nerve-blocking. Nerve-blocking undoubtedly has first place in local anesthesia. I am of the opinion, however, that it is often used when better, quicker, and more gratifying results to both operator and patient would be obtained from the simpler operation of infiltration.

Novocain-suprarenin is so much safer and more practical than any other local

FIG. 7.



anesthetic that I am anxious to see it in general use by all careful, practical men who have the interest of their profession at heart. I know of nothing that would advance our profession more safely and rapidly and help to produce a better class of work than the use of novocain-suprarenin.

I wish to express my thanks to Dr. Donald Guthrie, chief surgeon of the Robert Packer Hospital at Sayre, for his suggestions, and to Dr. Richard H. Riethmueller for his translation of Dr. Fischer's work on "Local Anesthesia in Dentistry."

68 WEST NORTHAMPTON ST.

Diseases of the Dental Pulp.

I. Diagnosis.

By HERMANN PRINZ, D.D.S., Philadelphia, Pa.

BEFORE entering into a detailed discussion of the clinical application of the diverse methods employed in the examination of a diseased pulp, let us briefly reiterate what is generally understood by "diagnosis." Its object is to enable one to recognize—

(a) The existing disease, by a specific name.

(b) The respective stages and the peculiarities of the disease.

(c) The existing or possible future danger.

From the viewpoint of the clinician, it is of interest to ask, What practical values are derived from a diagnosis? Some operators make the radical statement, with but slight modification, that a pulp which has been painful for a more or less prolonged period of hours should at once be devitalized without further consideration, and they regard a correct diagnosis of the various diseases of the pulp as being of no practical value. The opponents of such radical views look more favorably on the conservative management of this delicate organ, and to them the state of health of the pulp is of paramount importance in regard to its further conservative treatment. The ancient medical axiom, *Qui bene diagnoscit, bene medebitur*, which may be freely translated, "A good diagnostician is a good physician," is directly applicable to the recognition and the future treatment of diseases of the dental pulp.

The correct interpretation of the various principles involved in the recognition of the disturbances of the pulp are of the utmost importance for the preser-

vation of the involved tooth. Each definite type of pulp disease requires specific treatment for its amelioration, and unless we recognize this fact we do not render our best services to our patients.

The object of the practice of clinical dentistry, considering it in its broadest sense as a branch of the healing art, is to institute preventive measures, to relieve suffering, and to cure disease. These purposes are not achieved by the haphazard utilization of a few stereotyped therapeutic formulas or of certain mechanical procedures, but they are based on a thorough knowledge of clinical pathology.

To support our contention regarding the diagnosis of diseases of the pulp, let us cite a few illustrative cases.

Without having made a correct diagnosis, arsenic is placed upon a purulent pulp. Practically no results are obtained, since this drug is a protoplasm poison which does not act on dead tissue, *i.e.* pus. Nevertheless, the drug is made to carry the blame of its failure to act upon the pulp. If the pus is evacuated and arsenic is placed on the remaining highly inflamed pulp stump without the inflammation having been previously relieved, intolerable pain is absolutely certain to follow. Again the drug is blamed for the unexpected reaction.

Or a patient may present himself with severe pain in an otherwise sound upper first molar. After a few routine applications of aconite and iodine have been made without obtaining the desired results, it is decided to devitalize the pulp with arsenic. Many visits of the patient are necessary, and the "painless killing" of the pulp turns out to be a barbarous

joke, and all this expenditure of time, nerve force, and money on account of inexcusable pathologic ignorance on the part of the practitioner is wasted. A diagnostic inquiry might have revealed the fact that this patient suffered from a severe attack of influenza, which is prone to cause a hematogenous infection of other tissues, and in this case the pulp of the particular tooth in question may have been a point of lowered resistance.

A correct diagnosis of a normal, a diseased, or a dead pulp *in situ*, considered from the viewpoint of the clinical pathologist is always a matter of great difficulty, and the difficulty is materially increased if the tooth under consideration does not present any visible signs of derangement, or if the objective complaints as referred to by the patient are of an obscure nature.

The intelligent interpretation and the harmonious correlation of the various data, as obtained from a verbal examination of the patient and the diverse methods involved in a physical inspection of the diseased tooth, tax the diagnostic skill of the operator to the utmost. It should be emphasized that only those who possess a sufficiently broad knowledge of the fundamental sciences of the medical art, an extensive clinical experience, and a keen analytic mind, will ever master the difficulties involved in completely diagnosing the diseases of the pulp. The decision of the "lightning" diagnostician should always be looked upon with skeptical reserve, and the diagnostic report as rendered *in absentia* by an X-ray laboratory man from a roentgenogram with the stereotype arrow pointing to a spot about the apex of a tooth may be regarded as an aid, but not as a diagnosis.

SPECIAL PROCEDURE IN MAKING A DIAGNOSIS.

In making a diagnosis it is always advisable to follow a systematic scheme in order to avoid mistakes of omission. Suitably printed examination charts in which the obtained data may be quickly entered are valuable aids in saving time

and in preserving uniform records. Aside from the dental diagrams and general record columns as ordinarily outlined on these charts, space should be provided for recording the findings of the special examination. The special examination of a diseased tooth should include—

- (1) The antecedent history of the case.
- (2) Manifestations of pain.
- (3) Physical examination of the tooth:
 - a. Exploration and inspection.
 - b. Color.
 - c. Transillumination.
 - d. Conductivity of temperature.
 - e. Percussion and palpation.
 - f. Roentgenogram.
 - g. Testing of the pulp by the faradic current.
- (4) A differential diagnosis.

ANTECEDENT HISTORY OF THE CASE.

The antecedent history of the case—the anamnesis—is of the utmost importance; frequently the decision of a diagnosis hinges upon the facts obtained from an historical examination. Inquiry into possible hereditary taints, such as syphilis (Hutchinson's teeth, necrosis), into causes of the present disease as a sequence of some previous disease, such as rheumatic affections, colds, antral infection, malaria, influenza, etc. (idiopathic or secondary pulpitis); occupation, as working in acid or match factories (dissolution of the crowns of the teeth, phosphorus necrosis); handling of lead, mercury, bismuth, etc. (stomatitis), glass- and sand-blowers (abrasion); glucose and candy-makers (candy-makers' caries); turners of mother-of-pearl (pericementitis); personal habits, as biting threads (pericementitis); clay-pipe smokers (abrasion); chewing of straw and grain (actinomyces); the use of certain tooth preparations, as charcoal tooth powder (tattooing of the gums), and specific events in the history of the patient, including the prodromes and the suspected causes, are of diagnostic value.

PAIN.

Pain as subjectively expressed by the patient provides the diagnostician with

the most reliable information concerning the nature of the existing disease. Pain is an expression of disease; it is the conscious manifestation of a morbid change within the nerve centers brought about by some form of irritation, and it is always referred to the periphery. It is a sensation feared by man, the alleviation of which is constantly attempted by the physician, although it is his most reliable assistant. It is the monitor of approaching ills, and incidentally is the criterion of the intensity of a traumatic insult. To its relentless demands the most obstinate patient has to submit. Instinctively, the patient seeks to protect a painful organ.

Pain is a severe but necessary law of nature, but, like all her laws, it is undeviating in its course; it appears not only as a beneficent monitor, but also as a constant tormenter. "Pain is necessary for guarding us in the fight against the forces of disease; it precedes or accompanies the outbreak of most diseases, and warns us that the body is sick and needs attention, although often it may be absent in the most dangerous diseases, thus giving the patient false assurance. The outward expression of pain is by no means a guide to its actual intensity, as pain largely depends on the psychic condition of the patient." (Goldscheider.)

An analysis of pain should be begun by having the patient point out exactly the spot or region in which it is felt. If the pain is of a radiating character, it is necessary to differentiate between the painful focus and its peripheral radiations. Frequently, it will be observed that the painful focus coincides with the area in which the pain was localized at the beginning of the attack. However, occasionally a pain may radiate in various directions and may run a most irregular course. Incidentally, with the location of a pain, the time of its appearance deserves some consideration. The onset of pain may be associated with some definite hour of the day, or it may be coincident with and dependent on certain occurrences, such as the ingestion of food, the application of heat or cold, etc.

The duration of the painful sensation must also receive due attention.

The intensity of pain, judged from its quantitative variations, depends partially on the intensity of the irritation causing it and partially on the psychic characteristics of the patient. The same etiologic stimulus which may be endurable to one person may seriously disturb the psychic equilibrium of another. "This double dependence of the intensity of the painful sensation on stimulus and irritability, and the impossibility of projecting externally the psychochemic events in the sensory nerve substance that take place when pain is experienced, render illusory an attempt to estimate the quantity of the sensation for diagnostic purposes." (Schmidt.)

The quality of the pain as expressed by the patient is a relative term, although frequently much information may be gained from the description which he gives. Such descriptive terms as pain of a boring, throbbing, fulgurating, lancinating, radiating, or diffuse character, or many other similes, such as gnawing, jumping, etc., are merely clinical expressions of the quality of the painful sensation. An exact analysis of the existing pain demands an accurate determination of all the factors which influence the intensity of the sensation, either in the positive or the negative. Such modifying factors are intimately connected with the causative condition, and are therefore of the greatest importance from the viewpoint of the diagnostician. Modifying factors of pain may be classed as psychic, *i.e.* excitement, suggestion, diversion of attention, etc.; mechanical, *i.e.* position of the body, motion, percussion, pressure, etc.; thermal, *i.e.* changes of the weather, cold, draft, etc., and chemical, either dietetic or remedial, *i.e.* local or general. There may also be associated manifestations of a subjective or objective nature. While some of these manifestations may be remote in their nature, as, for instance, vomiting in severe neuralgia, others may be interpreted as being actual symptoms.

The kind of pain as subjectively ex-

pressed can be determined by questioning the patient. If a carious defect is present in the tooth under consideration, the application of certain chemicals to the carious spot also may furnish fairly valuable diagnostic hints. The application of a few drops of a 5 per cent. formaldehyd solution in a deep-seated cavity, for instance, as Preiswerck suggested, will call forth a series of painful reactions. Depending on specific conditions, as, for instance, the presence of acute febrile diseases, especially malaria, influenza, and rheumatic affections, of neuralgic tendencies, anemia, menstruation, gestation, etc., other questions, of course, will suggest themselves.

COLOR.

A differentiation should be made between superficial stains—as caused by tobacco, chemicals, food and drugs—and bodily discolorations as a sequence from death of the pulp. Superficial discoloration may be brought about directly by the various filling materials, or indirectly by the formation of metallic salts and oxids from amalgams, metallic posts, etc., by recurrent caries under the fillings, or by leakage of the filling. Death of the pulp usually produces various shades of darkening of the tooth, ranging from a grayish discoloration to an almost black color.

TRANSILLUMINATION.

Transillumination of a tooth by means of an electric mouth-lamp may furnish a fairly well-outlined shadow picture of its living pulp; the picture is much diffused when a dead pulp is present. Owing to the variation in thickness of the crowns, the anterior teeth are more easily transilluminated. In the premolars and especially in the molars the thick body of the tooth crown materially obstructs the passing rays. The transparency of a tooth may not be altered perceptibly by the death of its pulp. Transillumination should always be conducted in a dark room, so as to intensify the shadow picture of the pulp.

CONDUCTIVITY OF TEMPERATURE.

A pellet of heated gutta-percha, or some other heated material which is a poor conductor, is placed on the surface of the suspected tooth. A tooth with a diseased or dead pulp does not respond in the same manner as a tooth with a normal pulp. A purulent pulp usually responds quickly to a temperature above the normal; an acute inflammation of the pulp is often recognized by the application of cold water or ether or the ethyl chlorid spray, while a dead pulp does not respond at all. By continuity the heat rays may produce a response from the pericementum. The thickness of the tooth structure and the presence of various filling materials may, according to their physical nature, increase or decrease the conductivity of temperature changes.

Walkhoff makes the statement that the normal pulp will not react between 60° F. (15° C.) and 120° F. (49° C.). Pain produced by water below 90° F. (32° C.) indicates, according to his conception, inflammation, while pain produced by water heated above this temperature indicates a purulent condition. A most interesting exhibition of the thermal reactions of the pulp was given by the late Louis Jack. He has shown that some individuals readily tolerate temperature changes as applied to their teeth between 32° F. (0° C.) and 75° F. (24° C.) below, and between 118° F. (48° C.) and 135° F. (57° C.) above the normal temperature of the body. Some patients will experience pain between 75° and 77° F. (23° and 24° C.), while others will not complain even above 145° F. (63° C.)

PERCUSSION.

Percussion is best performed by striking the tooth a sharp blow with the butt end of a steel instrument. The peculiar dulness of the resultant sound of a tooth with a purulent or dead pulp as compared with that of a normal tooth can be distinctly discerned by the trained ear. The dulness of the sound is caused by inflammatory changes of the peri-

dental membrane as a sequence of a diseased or dead pulp or from external causes. The infiltration of fluid between and in the fibers of this membrane changes the relationship of the tooth to the alveolar bone, and consequently the sound waves produced by the tapping have not that full, clear tone which we perceive from a similar percussion of a tooth with a normal pulp.

ROENTGENOGRAMS.

Roentgenograms are always serviceable, and should be insisted upon in every case of doubtful diagnosis. The correct interpretation of an X-ray picture implies a thorough familiarity with the normal anatomy and its variations and the clinical pathology of the involved structure, combined with a comprehensive knowledge of the appearance of these same structures under the X-rays. It must be clearly understood that a roentgenogram merely depicts a verified gradation of shadow casts produced by the passage of the rays through substances of different density. Dark areas on the negative indicate places lessened in their density, *i.e.* the rays pass through these rarefied tissues more readily than through the surrounding structures. The roentgenogram does not indicate the physical nature of these rarefied areas.

Ordinary roentgen films or plates do not offer any perspective view of the object, as only two dimensions are portrayed in the picture. For ordinary diagnostic purposes such views answer quite well. A more accurate knowledge is gained from stereoscopic pictures, or from two or more roentgenograms taken at different angles.

To facilitate the intensifying of the very important minute details which naturally will assist in the correct interpretation of the roentgenograms, numerous devices have been suggested. The principle involved in the use of these apparatus centers about the advantages obtained from the intensified contrasts between light and darkness and in the magnification of the object.

Acute types of periapical disturbances of very recent date are usually not discernible in the X-ray picture, since rarefaction of the involved areas has not as yet occurred. Chronic disturbances of the tissues surrounding the roots of teeth are more or less pronouncedly manifested—since the existing osteitis offers less resistance to the passing rays. The disturbances include chronic proliferating pericementitis, either singly or associated with osteitis, with a granuloma, or with a cyst. The suppurative type with a rarefied area about the apex of a tooth which is filled with pus, or with pus discharging through a fistula, is clearly depicted. Pyorrhea alveolaris—chronic suppurative osteo-pericementitis—always shows marked areas about the affected teeth and the involved bony structure; this is equally true of a granuloma and a cyst.

Electric Examination.

A weak faradic current, as induced by the induction coil, in its passage through the body of a vital tooth, produces a more or less pronounced reaction which is an expression of the sensory innervation of its pulp. By carefully gaging the current, the resulting irritation expressed as sensation becomes the most valuable diagnostic agent in determining the stage of the vitality of the pulp. The information obtained with the electric pulp tester is so very gratifying that the method of its application needs to be discussed in detail.

THE ELECTRIC PULP TESTER AND ITS ACCESSORIES.

In a remarkable book by Magitot¹ (Paris, 1867), the following statement is recorded: "This examination [of the dental system], under circumstances so obscure, demands careful attention. . . . Another method has also been proposed; it consists of causing an electric current to pass along the whole extent of the dental arches by means of one of the little induction apparatus so frequently employed nowadays in medicine. By the

passage of a current so feeble as not to cause of itself any pain, the carious tooth will become the seat of an acute and clearly localized pain."

John S. Marshall,² in a paper entitled "Electricity as a Therapeutic Agent in the Treatment of Hyperemia and Congestion of the Pulp and the Peridental Membrane," makes the following statement: "As a means of diagnosis in obscure cases of the vitality or non-vitality of the dental pulp, I know of nothing so sure to demonstrate to a positive certainty these conditions as the electrical currents, both the galvanic and the faradic. In the more obscure cases, however, the faradic is superior to the galvanic, for if there is the slightest vitality remaining in the pulp, it will demonstrate it instantly by causing a response in the tooth."

In 1896, Woodward³ demonstrated the following: "If a few cells of a cataphoric apparatus are in action, and the positive electrode be applied to the dentin or metallic filling in a vital tooth, while the negative pole is at the cheek or wrist of the patient, a distinct sensation should be felt, while in case of a dead pulp there will be no response; usually even a small filling will transmit a distinct shock in a vital tooth, which is absent in a devitalized tooth. A mild interrupted current has also been used for the test."

The recommendation of testing the pulp by the electric current has never received the indorsement of the profession which it justly deserves. In 1902, Fuyt⁴ published his researches "concerning the use of weak interrupted currents for the purpose of locating certain diseases in the pulp." About the same time, but independent of Fuyt, Hafner⁵ utilized the reduced direct current for this same purpose, and he published his observations in the annual report of his institution. Since then quite an extensive literature on this interesting subject has appeared, the more important publications being those of Witthaus,⁶ Grevers,⁷ Hamburger,⁸ Frohmann,⁹ Hesse,¹⁰ An der Lahn,¹¹ Schröder,¹² Tousey,¹³ etc.

It is interesting to note that the various observers differ as far as the nature of the electric current is concerned. Fuyt advises the primary current and Schröder uses the secondary current of the faradic battery, while Hafner advocates the reduced direct current. The alternating current cannot be used for such a purpose unless a generator be interposed to change it to a direct current. All investigators, however, obtained precisely the same results. To judge from the various publications on the subject, coupled with our observations, the primary and secondary combined faradic current is best suited for this work on account of the simplicity of the apparatus and the easy manner in which this current can be regulated.

THE ACTION OF THE FARADIC CURRENT ON THE PULP.

The diagnosis of the condition of the pulp for clinical purposes resolves itself into the recognition of hyperemia, acute simple or purulent inflammation, and death of this organ. The action of the electric current on a sound tooth calls forth a definite sensation which is the physiologic expression of the normal reaction of a patient to electric stimulation. The strength of the current needed for this purpose varies with the individual. The reaction manifests itself in a peculiar tingling sensation, but *not in pain*. This point is known as the "irritation point." After having established the irritation point in a sound tooth of the patient, and after having expressed it in figures from the markings on the tube of Duchenne, it is a simple matter to distinguish a diseased or a dead pulp from a healthy pulp. By comparing these figures a reliable clue for the diagnosis of an existing disease of the pulp is furnished. The following scheme may serve as a guide for making a diagnosis:

(1) The normal pulp responds to the faradic current at its specific irritation point.

(2) The irritated hyperemic pulp re-

sponds to the faradic current slightly *below* the irritation point.

(3) The inflamed pulp (acute simple pulpitis) responds to the faradic current always *below* the normal irritation point. The more severe the inflammation, the more ready the response to the current.

(4) The suppurating pulp (acute purulent pulpitis) responds to the faradic current *above* the normal irritation point. The more severe the purulent condition, the less ready the response to the current.

(5) The dead pulp (necrosis or gangrene) does *not* respond to the current, not even to its full strength.

To illustrate this diagnostic scheme by figures as obtained from measurements with the tube of Duchenne, the following data may serve as examples:

	Duchenne scale.	DIAGNOSIS.
1. Upper central incisors	3.5	Normal irritation point.
2. First upper right bicuspid	3.0	Hyperemia. (Tooth shows a slight carious defect.)
3. First lower right molar	1.5	Acute simple pulpitis. (Tooth shows a deep carious defect.)
4. Second lower left molar	7.5	Acute purulent pulpitis. (Tooth is apparently intact; it has a large compound amalgam filling.)
5. Second upper left bicuspid. No response from current.		Dead pulp. (Tooth has a large cement filling.)

TECHNIQUE OF APPLYING THE FARADIC CURRENT TO THE TOOTH.

The metallic hand electrode is held by the patient, or a wet cork or felt electrode is fastened to his wrist. The other pole carries the dental electrode, which is manipulated by the operator. The current is started at its lowest voltage—that is, the tube of Duchenne is completely pushed over the core, or the sledge is started at zero. The irritation point of the patient is now obtained by holding the dental electrode against any of the apparently sound teeth. A tooth corresponding to the one under observation is preferably selected for this purpose. The wet cotton of the electrode is placed

near the center of an accessible surface of the selected sound tooth, but always away from a present filling. The tube is now gradually withdrawn until slight, but distinct sensation is felt by the patient. The sensation must never be expressed as pain. The number on the scale of the tube is read, and the same maneuver is repeated on the suspected diseased tooth. The deduction obtained by comparing the two readings furnishes the irritation point of the diseased tooth. The average irritation point is not the same for every tooth and for every patient. A layer of thick enamel on a heavy body of dentin requires a stronger current, and *vice versa*. Consequently, the irritation point in the young is usually lower than in aged persons. The respective condition of the nervous system of a patient may also influence the

response to the current; a disturbed *psyche* is usually more sensitive to electric stimulation than a normal condition. If the electrode is placed on or very close to a metallic filling in a vital tooth, the response is very pronounced, and even painful, as compared with the same amount of current passing through a tooth without a metallic filling. This is also true if the electrode is placed on a thin shell of enamel which covers a metallic filling. The severity of the shock depends on the nature of the filling. All filling materials, with the exception of gutta-percha, are better electric conductors than enamel.

The tooth under observation must be dry, and not in too close contact with its

neighbors, as the current may switch to an adjoining tooth. The close proximity of large contour fillings or metallic crowns deserves special care. In such cases the rubber dam, or strips of the dam placed between the adjacent teeth, is necessary for insulation. The electrode must not be placed too near the gum line, or the gum tissue may react before the pulp is reached. The sensation felt on the gum is quite different from that in the pulp. It is not acute, but manifests itself as a tickling or crawling feeling. Devitalized teeth which carry metallic fillings will also react if the electrode is placed on or near the filling; they will not react if the electrode is placed on sound enamel, provided that the root-filling consists of gutta-percha. If the root carries a metallic post, a prompt shock is felt from the current. If a present filling reaches the gum line, a very quick and painful response is experienced, even from a mild current, when placed in contact with the filling. The absence of enamel acts somewhat similarly to the presence of a filling. A shock is usually produced when the current is placed on exposed dentin, which must, therefore, be avoided. A tooth with a dead pulp, but with a sound crown, may also react to the current if an acute pericementitis is present. Usually, however, a somewhat stronger current is required than that which is necessary to establish the normal irritation point. In multi-rooted teeth the pulp may be dead in one canal and highly inflamed in another canal. In such cases a reaction similar to that which is obtained from purulent pulpitis is usually observed.

Disturbances involving the general nervous system, especially locomotor ataxia, manifest themselves in the teeth by a more or less complete analgesia of their pulps. In such instances, although the pulps seem to be apparently normal, the current produces no response.

The examination of the pulp by means of the faradic current requires a thorough mastering of the many details con-

nected therewith. The practitioner can best familiarize himself with the current by testing the instrument on himself or on an experimental patient. The teeth, gums, lips, and tongue are the organs which should preliminarily be tried. Before testing a tooth, it is always advisable to establish, if possible, the irritation point in a corresponding sound tooth. The difference of the recorded figures furnishes the base for its diagnostic utilization. It is understood, of course, that no therapeutic measures have been previously applied to the tooth under consideration or to the general system; their presence would materially influence the reaction of the current. Morphine, for instance, if administered in average doses, will reduce the reaction of the current from three to four degrees below the normal irritation point, while chloral hydrate in 15-grain (1 gm.) doses acts within three to four minutes, and reduces the scale two to three degrees.

All of the enumerated methods of diagnosing the respective states of health of the dental pulp should be looked upon as helpful aids, but by no means as absolute proofs. The results obtained with the faradic current are so very superior to all the diagnostic procedures that its use for such purposes deserves to be highly recommended. Men with only limited experience in employing this apparatus have passed premature judgment regarding its merits and its shortcomings. Incompetence as displayed in the utilization of a certain apparatus does not necessarily indicate that the instrument is at fault.

The direct diagnosis of an inflamed pulp by the various methods as outlined above should always be supplemented by a *differential diagnosis* in regard to a concomitantly existing disturbance of the peridental membrane of the affected tooth or of a general disease. This examination constitutes the absolutely necessary adjunct for a final diagnosis. The appended scheme may serve as a basis for a differential diagnosis of the inflammatory diseases of the pulp and the peridental membrane:

Differential Diagnosis.**PULP.**

The pain is of a sharp, lancinating character; in the earlier stages it is distinctly paroxysmal. On assuming a recumbent position, or with excitement and fatigue, the pain usually increases.

The tooth is exceedingly sensitive to thermal changes; in its inceptive state, cold—and later on, heat—intensifies the pain.

There is no swelling of the soft tissues about the tooth, and no tenderness to pressure.

The tooth is not elongated, nor does it strike first in occlusion.

At times it is quite difficult to determine exactly which tooth is affected, as the pain induces reflex symptoms in other teeth and tissues.

Percussion is negative.

It is possible to bite upon the tooth and to use it in mastication without any special sensation, if thermal extremes be avoided.

The tooth usually shows a carious defect.

PERIDONTAL MEMBRANE.

The pain is localized, dull, steady, boring, or throbbing in character; it is not paroxysmal, nor is it increased by a recumbent position. Pain remains more or less constant without much reference to external conditions.

There is little reaction to temperature changes; cold may give relief, while heat does not materially affect it.

The tooth becomes exceedingly sore. Pressure at first usually relieves the pain; later it is intensified. In the later stages swelling is common.

The tooth is raised in its socket, and strikes before any of the others occlude.

The diseased tooth is readily located; the pain is steady in degree and in its position, and the soreness readily locates it.

Percussion induces pain.

The tooth is very sore to the touch; occlusion in mastication or ordinary shutting of the mouth produces pain, irrespective of thermal changes.

Carious defects, as such, are of no consequence.

The final diagnosis is based on the observations obtained from a careful comparison of all of the elucidated facts and usually leads to a *diagnosis by exclusion*. Its interpretation results in the prognosis, and the final goal of all clinical procedures—the treatment of the existing disease.

BIBLIOGRAPHICAL REFERENCES.

(¹) Magitot: "Treatise on Dental Caries." Transl. by T. H. Chandler. Boston, 1878.

(²) Marshall: DENTAL COSMOS, 1891, p. 973.

(³) Woodward: "Proceedings Philadelphia Academy of Stomatology," 1896.

(⁴) Fuyt: *Zahnärztliche Rundschau*, 1902, p. 533.

(⁵) Hafner: *Schweizer. Vierteljt f. Zahnheilk.*, 1902, No. 4.

(⁶) Witthaus: *Deutsche Monats'ft f. Zahnheilk.*, 1902, No. 11.

(⁷) Grevers: DENTAL COSMOS, 1903, p. 58.

(⁸) Hamburger: *Deutsche Monats'ft f. Zahnheilk.*, 1907, No. 6.

(⁹) Frohmann: *Ibid.*, No. 3.

(¹⁰) Hesse: *Ibid.*, No. 3.

(¹¹) An der Lahn: *Oesterr.-ung. Vierteljt f. Zahnheilk.*, 1907, No. 2.

(¹²) Schröder: "Der Induktionsstrom als Diagnosticum in der Zahnärztlichen Praxis," 1907.

(¹³) Tousey: DENTAL COSMOS, 1909, p. 513.

(To be continued.)

Mental Myopia *vs.* Public Sanitation.

By CHAS. M. MacKENZIE, M.D., D.M.D., Sprague, Washington.

IF an ounce of prevention is worth a pound of cure, there is certainly a great opportunity to apply this knowledge to the benefit of the public health throughout the United States by the employment of fountain cuspidors on the streets and in the corridors of all public buildings, trains, etc.

Modern sanitation demands this, because it offers the best means of eliminating, at the source, the greatest remaining menace to public health.

When we consider that the excretions from the mouth, nose, and throat contain a greater number and variety of micro-organisms than those from any other part of the body, it is apparent that our health authorities are suffering from a state of mental myopia when they permit spitting on the streets and sidewalks and tolerate the stagnant centers of contamination caused by the filthy cuspidors in many public buildings, railway trains, stations, etc.

In almost every other respect communities have progressed along the line of public hygiene, but this ancient and evil habit of throwing sputum and phlegm carelessly about persists today with all its horrors, spreading disease and death in its wake.

When this practice is viewed from our wider knowledge of bacteriology it is appalling, especially when we recall that the application of this knowledge to medicine during the past thirty years has been the means of lengthening the life of man several years. While it is no doubt true that physicians as a class are not so familiar with bacterial flora of the human mouth as are dentists, and for this reason may not appreciate as keenly the great danger from this source,

it is certainly not too much to say that they all know the mouth, nose, and throat to be about the only places in the body where man constantly carries bacteria.

When one pictures the degree of air-infection from one million tuberculous people in the United States, a large percentage of whom are ignorant of having the disease, the countless numbers who are suffering from pyorrhea with pus constantly present in the mouth, the scores of alveolar abscesses and buried crypts of tonsils, to say nothing of the catarrhal affections of the nose and throat from which so many people constantly suffer, and when he reflects upon the contagious character of many of these germs and the careless way in which these excretions are ordinarily disposed of, he must marvel at the elaborate and efficient protective system of the human organism, and wonder that epidemics or pandemics—for this condition prevails everywhere—are not more frequent.

When we consider the bacteriology of the saliva with pneumococcus, streptococcus, staphylococcus, influenza, tubercle and frequently diphtheria bacilli, not to record the countless other organisms constantly present in the sputum, and recall the diseases of known etiology where infection can take place through the air, such as diphtheria, influenza, pneumonia, and tuberculosis—and the diseases of unknown etiology, such as whooping-cough, typhus fever, measles, etc., usually considered transmissible by this means—it is little wonder that under present conditions diseases of middle life are increasing, especially when we know these diseases are microbic.

Personally, I could never see any

sound scientific basis for the placing of the so-called "Flu ban" on different communities by health officers, when the streets are the most prolific center of danger and the atmosphere in many places reeks with disease germs. It would be interesting to know just what percentage of respiratory diseases is contracted from this source, since influenza is placed in this category; however, it is reasonable to assume that a very large percentage of respiratory disease germs reach the nose, throat, and lungs directly from these public places where they have been deposited by persons affected by disease.

A short time ago, when the influenza "ban" was on in our community, it was so strict that all places of public business were closed, travel of every kind was restricted as far as possible, and social intercourse was avoided generally outside of the home. While these extreme measures were adopted as a preventive, the streetmen went merrily about the task of sweeping streets (dry), and pedestrians got the benefit of the germ-laden dust directly in their faces as a reward for having finely paved the streets. Had these streets been flushed with water and their filthy contents drained into the sewers it would have been more in keeping with the efforts of the self-sacrificing citizens who abandoned their personal interests for the public good; but the adoption of these radical measures on the one hand, and the glaring disregard for the fundamental principles of public sanitation on the other, typify the conditions existing generally throughout the country.

Whatever controversies exist at the present time in the medical and dental professions over many of the bacteriological problems, all agree that public sanitation is indispensable to the public health, and that the science of bacteriology should be applied as far as practicable to the problem of public sanitation.

It is unreasonable to suppose people will not expectorate when they have occasion to do so, but it is reasonable to expect they will, after a short time,

recognize the benefit from the use of any receptacle the authorities might provide for this purpose. No doubt, the reason public attention has never been arrested by this practice is owing to the fact that disease itself is not always obvious, and consequently the channels by which its effects spread are frequently not recognized. I am sure this accounts for the apathy in the public mind toward problems of this kind. If, on the other hand, disease were more obvious, there is no doubt that centuries ago the public mind would have been stirred and legislation enacted along this line.

Let us suppose every alveolar abscess pointed on the face instead of in the mouth, and every case of pyorrhea where pus is present caused a series of running fistulas on the jaw, that diseased tonsils and catarrhal affections of the nose and throat were manifested externally as they are internally, and the excretions from these diseased tissues were deposited as they are now; how long would it be before the indignant public would demand action from our legislatures and health boards? Well, one must see this menace precisely from this standpoint to realize its importance, and when we know these conditions would cause infinitely less harm to the public health than many other diseases, such as syphilis, tuberculosis, etc., whose symptoms are hidden from the public eye, we can begin to grasp the magnitude of this menace, and see it as it appears in the eyes of the dental profession.

In conclusion, it is worthy of remark that if we study the history of medicine over a long period of time we find that great plagues were not conquered until the value of general community cleanliness was recognized, and they vanished when common sanitary precautions were instituted. And in view of the fact that our wider knowledge of medicine has given the scientific explanation for this result, it is strange that our regard for public hygiene has not been revolutionized.

It is questionable, if we attempt to judge historically, whether the world is

any healthier today than it was ages ago, and whatever progress has been made in this connection as the result of new discoveries in medical science, we cannot escape the conviction that from the dawn

of their recognition to the present time, the simple laws of sanitation have played the paramount rôle in the general scheme of prophylaxis.

CORRESPONDENCE

A Reply to "Why Not Chinese Silver?"

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—In an article by Dr. W. J. Nalencz of Chicago, published in the November issue of the *Journal of the National Dental Association*, a number of statements appear regarding the origin and history of the well-known metallic alloy "German silver." The author after reviewing its history as it is known to him, suggests to his readers that the objectionable term by which this metal is known to the English-speaking nations be supplanted by the more appropriate name of "Chinese silver." He also proposes that it be made a "dental issue."

Dr. Nalencz, in support of his contention, makes the following specific statement: "The Germans are claiming the honor of inventing 'German silver' unrightly; all of it belongs to China," etc. This the writer feels constrained to challenge. To him it has always appeared ironical that "German silver" should ever have become known by that term. The Germans themselves applied to it the term *Neu Silber* (new silver), and it is known in all German-speaking countries by that name.

This prompted the seeking of additional information, and after consulting encyclopedias published in the principal modern languages the following results were obtained:

All English encyclopedias credit the Germans with the invention of the metal, and denote it by the term "German sil-

ver." French and Spanish works of reference make mention of it in rather condensed form, and give it the name *argentan*, or *argenton*. To the French it also is known as *cuivre blanc* (white copper). It is noteworthy that in none of the above records was any reference found to China in connection with the metal.

More complete records were found in German encyclopedias, and I quote in translation from Brockhaus, a standard work:

Neu Silber; *Argentan*; *Kunst Silber* (artificial silver); *Packfong*. Brought to Germany from China at the beginning of the eighteenth century in the form of utensils. The Swedish chemists Engstrom (1776) and Rinman (1782) were the first to analyze this metal. In 1823 Dr. Geitner of Schneeberg (Germany), encouraged by the success of an English chemist through having been able to produce nickel in its pure state, also succeeded in making this metal in quantities to make it available for commercial purposes, etc.

Other German reference books record substantially the same, and in every one priority honors are given to China.

In view of these established records, the writer is inclined to express the opinion that Dr. Nalencz' statements are somewhat at variance with the facts in the case.

Respectfully,

CHR. MUETZE.

ST. LOUIS, MO.

"Relation of Caries to Pyorrhea; Symmetrical Caries."

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—In response to the queries of Dr. Herman Ausubel on the "Relation of Caries to Pyorrhea" and "Symmetrical Caries" in the February 1919 issue of the DENTAL COSMOS I should say that the causative factor of the one disease (pyorrhea) does not necessarily have an inhibitory influence upon the other (caries).

One has often noticed the mouths of people (and particularly men) who have spent their early youth in parts of the country where life is not industrially "a series of hurry-ups." These people have taken plenty of time in masticating tougher foods (not whole-wheat-flour bread), and thereby have developed a strong muscular activity of their jaws—to the extent of abrasion of the occlusal surfaces of their teeth. This thorough masticating habit has permitted the almost perfect union of the lobes of their teeth to the age of completed calcification. Upon having changed their mode of living, including the eating of predigested foods, tartar and serumal deposits have accumulated upon their teeth for longer periods, and, in the absence of cleansing of the teeth, have given rise to the formation of pockets and looseness, and finally to the necessity for extraction.

The question in regard to symmetrical decay is not fully understood. For myself, through observation, I believe in the chemico-parasitic theory, and that the origin of decay must be from without, this being followed by secondary decay (or decay from within) due to the self-

protecting properties of the lactic acid bacteria.

Those mouths in which the teeth may be covered with tartar and yet show no decay are found in those individuals hereditarily immune, who having been born normal, have lived normally and masticated foods of the tougher substances to the age of puberty, at which period the lobes of which the tooth is formed have become fully calcified and perfectly united without being subject to decay.

The mouths of the other variety, which are kept scrupulously clean by attention to the oral toilet, and which are periodically under the supervision of dental specialists, yet exhibit "new cavities in the teeth every three months," are of those persons who have enjoyed too much easy living, and have been eating largely predigested foods from their very childhood days, giving rise to continuous decay of the teeth, in spite of professional care, long before the full process of calcification and perfect union of the lobes of their teeth have taken place. In some cases, heredity and subjection to systemic or specific diseases may have interfered with the proper development of the teeth and the union of their lobes before they have become fully calcified.

On the other hand, the average person may be careful in his or her mouth toilet, yet what percentage of the people whom we would help know or correctly follow instructions as to how to clean their teeth properly?

PHILIP WARSAW, D.D.S.

CHICAGO, ILL.

PROCEEDINGS OF SOCIETIES

ANNUAL DINNER

OF THE

Dental Society of Chester and Delaware Counties,

CELEBRATING

THE ONE-HUNDRED-AND-FIRST ANNIVERSARY OF

DR. JESSE COPE GREEN.

Held at the New Century Club, West Chester, Pa., January 22, 1919.

AFTER the dinner was served, Dr. J. H. Crist, the president, introduced Dr. S. B. Luckie as toastmaster, as follows:

Dr. CRIST. *Gentlemen*,—I am pleased to welcome our honored guest, and visiting friends, as well as our members, to the annual banquet of the Dental Society of Chester and Delaware Counties. I trust that we may all live to enjoy another, the same as this, one year from tonight, and that we shall spend a pleasant and profitable evening. I have the pleasure of presenting to you a man who needs no introduction, our friend Dr. Luckie, who will act as toastmaster for the evening.

Dr. S. BLAIR LUCKIE, toastmaster. *Mr. President, our honored guest, and fellow practitioners*,—I welcome you to this our annual dinner. We have something like this every year, but this year it is a little larger and means a little more than usual. It is the custom at the meetings of the Dental Society of Chester and Delaware Counties, between the afternoon and evening sessions, for

the members to gather around the dining-table for a sociable hour during which every professional subject is tabooed. We are all boys then, every one of us; and I want you to feel tonight that this is a boys' party—a party for the boys, of the boys, and by the boys:

Has any old man got mixed up with the boys?
If he has, take him out without making a noise.

Hang the almanac's cheat and the catalog's spite!

Old Time is a liar—we're twenty tonight!

You notice, in a crowd of boys, very often, that there is one who is a little better liked than any of the others. He seems to have something about his makeup that attracts the friendship of the others, and they seem to center around him. In our society there is one among us who stands out in bold relief, more prominently than any of the other members of the society, and I think I can safely say, more prominently than any member of any dental society in the world. I do not think there is another

dental society in the world that has such a member. This member is still one of the boys; he has a youthful heart. He is cheerful, wise, just, full of sunshine, and loves his fellow men, and we always enjoy having him with us at our annual meetings. We always meet in West Chester—for no particular reason, but always meet here—and we enjoy his companionship. This year it was the consensus of opinion of the members of the society that we should not only have him present, but that we should throw the doors open wide and invite all his friends and our friends to gather with us, that they might meet him and that he might have an opportunity to meet his friends here once more. He is a distinguished citizen of Chester county and an honor to the profession, and I want you to stand with me and drink to the health of our honored guest, Dr. Jesse C. Green.

We have asked some of our boy friends to be with us this evening, and tell us how the character of our companion appeals to them. The first boy to speak is one who stands well in his history. He is an historian of considerable note, and I take pleasure in calling upon Dr. William H. Trueman, who will tell us something of

"Dr. Green's Relation to the Dental Profession's Uplift in the State."

Dr. WILLIAM H. TRUEMAN, Philadelphia. *Mr. Toastmaster and gentlemen,*—The early efforts of the dental profession of Pennsylvania to advance its educational interests, and thereby its usefulness to the community, through the state legislature, met with much discouragement. As early as 1845 an effort was inaugurated to obtain a charter for a dental college to be located in Philadelphia. It proved to be an unfortunate time for educational interests in this state. So many colleges had been authorized that the supply had overrun the need, and among them there was a general financial distress. Any increase in numbers was under a legislative ban. Our lawmakers could not be made to understand that this was an entirely new

project, for which there was a great need. Furthermore, professional opinion was divided as to the wisdom of the project; the few in existence were not meeting with desired success, financially, and opposition developed. It was not until the fall of 1852 that an earnest effort, after a compromise to avoid further delay, enabled the leaders of the profession to announce the opening of the first dental college in this state. This college proved an important professional uplift. Other dental colleges followed, and shortly graduates from dental colleges in Philadelphia made a favorable impress wherever dentistry was practiced.

The second uplift effort met with equal success. The State Dental Society was organized in the fall of 1868. Its first purpose was promptly attained. It brought about a closer union and a more effective co-operation among the progressive members of the dental profession in Pennsylvania. It brought them more in line with the members of the profession in neighboring states who had taken like action. So far as members of the profession were concerned, it was plain sailing. However, just as the college needed the legal recognition and authority of the state legislature to fully accomplish its work, so did the state society need a like recognition and authority from the state legislature to accomplish its ultimate purpose of fixing educational standards for dental practitioners, and for making them effective by means of a state law. There were no restrictions on dental practice: anyone, with or without previous instruction, was free to assume the position of a dental practitioner, although many operations pertaining to dental science seriously endangered health and life, so that it was fast becoming a menace to the community. The thinking men of our calling realized that there should be some educational standard recognized and enforced by state authority, and legal means provided by which the public could distinguish the qualified from the unqualified. Furthermore, while the dental schools were yearly patronized by larger classes, and were year by year

improving their facilities for teaching, they needed a larger patronage to make these improvements more rapidly and more permanent.

This the newly organized state society sought to provide in drafting a bill to secure legislation governing the practice of dentistry in this state, and designating a method of testing the fitness of those desiring in the future to enter the profession. A draft of the proposed dental law was presented to the society by a committee appointed for the purpose, and its various provisions freely discussed by those present. Dr. Green took an active part in that discussion. His long experience as a dentist, his standing in the community, and his scientific attainments gave weight to his criticisms and suggestions.

It was a truly representative assembly embracing members of the profession from all parts of the state—graduates and non-graduates, teachers from dental colleges, men advanced in years, veterans in the profession, and others just entering their professional career.

It was felt that the time had come when something more than a certificate from a preceptor, that in many cases meant little more than a receipt for his fee, should be required from one desiring to enter professional ranks. It was unanimously decided that, while a dental college diploma was much to be preferred, as a temporary expedient the successful passing of an examination by a qualified examining board appointed by the society should be accepted in its stead. The society recognized that by making the proposed dental law too stringent its enactment by the legislature would be endangered. The fear was well grounded. As conditions were then, it was a good, practical dental law; it was, however, turned down by the state legislature. Year after year, as Dr. Green doubtless well remembers, the various committees charged with its presentation to the law-making body returned reporting failure. Keeping at it won at last; the dental law, modified and amended to meet objections which had been made the excuse for its rejection,

was finally passed, signed by the governor, and became effective April 17, 1876.

It then encountered adverse public opinion, lay and professional. I commend to your reading the various reports from the committee on its enforcement year after year made to the state society relating the troubles they encountered, and finally overcame. They are found in the society's published proceedings.

With all due credit to those who bore the brunt on the fighting line, with wrangling lawyers and obtuse legislators, I am disposed to give to Dr. Green a full measure of credit in bringing about a lasting peace with the opponents of dental legislation. During his term as secretary of the examining board more than one disgruntled candidate for professional honors has returned from a trip to West Chester, to report, "I have seen Dr. Green. He has explained the matter to me, and it is all right. I was in the wrong."

How conditions have changed since some two score dentists met a little more than fifty years ago, in a lecture room of the Philadelphia Dental College, at the northeast corner of Tenth and Arch sts., to organize the Pennsylvania State Dental Society. Committees from the society can now go to the state legislature with confidence that their pleas will receive respectful attention. Dentistry, especially during the last few strenuous years, has received a well-merited, long-delayed recognition. It has been admitted to the health-conserving departments of many communities, it has found a welcome to our public schools, it has become a part of the National army and navy, and is credited with being an important factor in making our fighting forces so effective in bringing the great world war so quickly to a close. I congratulate Dr. Green on having lived to see the gradual upward and onward progress of the dental profession from small beginnings to its present exalted position, a consummation he has had a full share in bringing about.

In closing, may I express the hope that Dr. Green will place on record his long

and active career, and add to his profession's history his recollections of his early associates, to their honor and to the encouragement of the oncoming. It is much to be regretted that we know so little of the men who before the days of dental journalism laid so well the foundations of our profession. Many who worked hard and accomplished much are now quite forgotten.

Dr. LUCKIE. Our next young man on the program is one we all love, who has done a great deal for dentistry—Dr. Edwin T. Darby. Dr. Darby will tell us of

"The Advantage of Living a Century."

Dr. EDWIN T. DARBY, Philadelphia. *Mr. Toastmaster, venerable and honored guest, and fellow participants in this happy occasion,*—On the 13th of December of last year I came to West Chester to attend a banquet given in honor of our friend Dr. Green by the Historical Society of West Chester. The toastmaster on that occasion introduced me as an old friend and classmate of Dr. Green's, and continued by saying that I had been graduated with Dr. Green in 1865. I saw the diners scrutinizing me, and I wondered if they thought that I too was one hundred years old. I said to Dr. Phillips later, "It is true we were classmates, but Dr. Green was receiving an honorary degree." "Yes," said Dr. Phillips, "I understood that, but did not think it necessary to tell the audience."

I have known Dr. Green for a long time. On his one hundredth birthday I said to him, "We have known each other a great many years." He said, "Yes; thee came to see me in 1865, and had with thee Dr. B. J. Bing." "Do you remember the season?" I asked. "Yes, it was in the summer, and I think in August." He was correct.

That is only one of many illustrations that show how accurate his memory is. I have studied his life with interest, because I have wanted to know how I could live to be one hundred years old, and to

enjoy life as he does. I have known his habits pretty well. I know he is not a drinking man or a smoker, and is a small eater. Although he stays up late at night, he gets six or seven hours' sleep—six anyhow, which is all he needs. I know that he has been a busy man all his life. When in full practice, if there was a lull between patients, he would slip out and run around a square or two in order to fill his lungs with air, and would come back refreshed. These are some of the secrets of his long life.

But you tell me others whose habits are not so good live as long. I admit it. I remember hearing of two brothers named Wood who were called to testify in a lawsuit. They were both old men, but well preserved. When the first one had finished his testimony, which was given in an intelligent and lucid manner, and he was about leaving the witness stand, the judge said, "Mr. Wood, I have been much interested in your testimony; you seem to be well along in years." "Yes," he said, "I am eighty-seven." "I suppose," said the judge, "you have had good habits. You have not been a drinking man?" "No, I never drink." "You never use tobacco?" "No, never; I detest it." "You always keep good hours?" "Yes." "Well," said the judge, "I suppose good habits are conducive to long life." The other brother was then put upon the stand, and gave his testimony in the same clear and comprehensive manner. After he was through, the judge said, "I believe you are a brother of the man who testified a few moments ago. Are you older or younger?" "I am two years older." "Have your habits been the same?" "No; on the contrary, I have not gone to bed sober since I was a young man, I have used tobacco all my life, and have paid no attention as to regular sleep." "Well," the judge said, "I have been told that wood, to be good for anything, must be either very wet or very dry."

The gentleman before us, one hundred and one years of age, has had good habits, but he has been a hard worker. I remember him as a man of fifty. He was

one of the most prodigious workers that I have ever known. He worked hard at the chair during the day, and carved and baked teeth in the laboratory at night. Now, at a hundred and one, he reads the *Public Ledger* every day, which used to be the proof of a good Philadelphia eyesight. If people could read the *Public Ledger* they were supposed to have good eyes.

Now, I have been asked to speak to the toast "Advantage of Living a Century." I have not done that yet, but I hope, if I enjoy life as he now does, that I may. It has been said that old age has no advantages—but there *are* advantages; our dear friend is reaping them. He is having rest; he is having quiet; and has the love, esteem, and admiration of all who know him. That is worth something! There *are* advantages in old age. After one has borne the burden and heat of the day, has worked for thirty, forty, or more years at dentistry—or anything else, for that matter—a period of repose comes. He does not have to go to his office every day; he does not have to have an office at all. He can sit down and recount the joys and pleasures he has had. He can gather about him a lot of people, young and old, who have pleasant and kindly things to say to him. Best of all, if God spares his eyesight, he can read. And what is of greater enjoyment than the ability to read the books that one has wanted to read all his life?

I am not looking forward to old age with unhappy thoughts. I am looking forward to the time when I can get into my shop and spend as many hours as I like in tinkering, working on my lathes and doing things that heretofore I have had no time for.

So there is no reason, my good friends and my dear old friend, why men should not wish to live for a century, I sincerely hope that you may be spared for many years to be a joy and blessing to all who know you.

Dr. LUCKIE. The next speaker is a boy with a three-decker brain. We don't call him Justice and we don't call him Squire, but he has good judgment and

knows the worth of our honored guest. He will speak on

"Reminiscences of Dr. Green as a State Examiner."

Dr. L. ASHLEY FAUGHT, Philadelphia. *Mr. Toastmaster, our honored guest, and fellow practitioners*,—I would not have you think for one moment that I can entertain you with the flowing language that has just come to us from our good friend, Professor Darby.

I recall, as I rise to my feet, a story I heard not long since regarding a certain colored person who went into a cutlery store to get a razor. The proprietor was showing him the various kinds, and descanting upon their virtues; among others he brought out the Gillette blade, saying, "This is the latest and finest thing; it does thus and so." The colored man said, "That's all right. It may be very good for shaving, but it's not much good for social purposes." I do not believe I am much good for social purposes. Still, I shall try to act on the basis of what I believe I am entitled to, and that is to talk about anything else but the subject assigned me to talk upon—"Reminiscences of Dr. Green as a State Examiner."

The State Board of Dental Examiners came into prominent notice back in the early '70's—about 1872; I am sure it was as long ago as 1876. I remember that about 1880 it was very prominently mentioned in one of our leading journals, because at that time they had to give legal notice of the time of their meeting. We find Dr. Peirce mentioned as chairman and Dr. Wm. Magill as secretary. A little later on, Dr. Green was secretary, Dr. Magill becoming chairman, and Dr. Magill and Dr. Green made a most marvelous team. You had merely to look on them to feel that there was some potency in a State Board of Dental Examiners. I recall them with interest. They were of commanding appearance. They were men of great feeling and thought, and a man must have trembled when he came up for the purpose of hav-

ing his certificate indorsed by this board. Indeed, I recall that in one of the public notices there was the sentence, "All candidates will promptly report to the president or secretary at the first session." What could scare a man more than, immediately on arriving, having to go before one or both of these imposing persons?

As I have said, these gentlemen, imposing in their appearance and commanding in their manner and attitude, must have impressed the various candidates in different ways. I came into the board in 1893. Of course I did not bring anything like the attitude I am describing to you, but I overheard many men discussing in corners their feelings toward this board—particularly sometimes after they had encountered it, and it had not turned out as they thought. One remark was much like what I heard one soldier make to another. They had returned from the front, and saw an ambulance coming with a wounded soldier who was pretty well shot up—and the ambulance was pretty well shot up, too. The doctor saluted him and said, "Hello, Jim!" Then he took an unfair advantage of the wounded man, and said, "What do you think of this war?" "Well," the man answered, "it's a hell of a war!" After a moment's thought he added, "But, you know, it's the only war we have got." So, although people did not express the best opinion of the State Board at that time, it was the only board we had, and those of us who were elected then thought that it was a good board. Notwithstanding the strictest regulations with regard to qualifications, Dr. Green and Dr. Magill, out of the goodness of their hearts, did all they could to help the gentlemen attain their end.

Dr. Green has attained a wonderful age; he is like a century plant. He has reached his full growth; he did that last year, and tonight he is old enough to flower. I hope he will go on for many years. I am glad to get his signature on the menu cards, I have seen it on diplomas many times, and I shall prize it very highly. In closing I congratulate

Dr. Green and congratulate you on the entertainment this evening.

Dr. LUCKIE. We now come down to home talent—one of our Chester County boys, born, bred, and married in Chester county. Our fellow member, Dr. James L. Paiste, will tell us

"What Dr. Green Has Been to Our Society."

Dr. JAS L. PAISTE, West Chester. *Mr. Toastmaster, members of the Chester and Delaware Dental Society, and honored guests,*—I have been asked to respond to the toast "What Dr. Green Has Been to Our Society." I can sum up my response in two words: "An Inspiration."

We are often told that the work of our profession is not conducive to health, and that on account of the close confinement it means short hours or short lives, but here we have an example to refute that argument, for we who know Dr. Green know that he has led a very active life from early morning until late at night. In the prime of his life, after working all day at the chair, he spent many evenings in his laboratory carving and baking teeth, and I have seen many of them which for shade and mold were as good or better than those which are supplied to us by the manufacturers.

Our society was organized about twenty-five years ago. The first meeting was held in Dr. Green's office, and from that day to this he has been to us as the sturdy oak is to the forest. It was my good fortune to be present at that first meeting, and we learned then to look forward with especial interest to the meetings held in West Chester, feeling sure that we would not only have our distinguished member with us, but that he would entertain us with some interesting experiences. One that I recall was a description of the extraction of teeth under mesmerism. I think it was in the '40's that the experiment was being tried in West Chester of painless extraction while the patient was under the influence of mesmerism. Dr. Green was

asked to operate. He told us it was the only time he had ever really tried to hurt a patient and failed to do so. The experiment was tried once too often, for the mesmerist at last used his power on a person whom he could not revive, and was obliged to call Dr. Green in to help him. This brought the experiments to a close.

Dr. Green also gave us descriptions of the trials and burdens they had to overcome alone in those days—for at that time the practitioners tried to keep secret any discoveries they made which would benefit the profession. Consequently, they had no exchange of ideas, and no one with whom to consult.

When we asked Dr. Green how he retained his youth and vigor, he usually answered that he believed in plenty of outdoor exercise. He walked a great deal, and in later years rode his bicycle. At that time our society held three meetings a year, the winter meeting in West Chester, the spring meeting in Chester (when we went with appetites whetted for those delicious planked-shad dinners), and the fall meeting in different places over the two counties. I recall a fall meeting at Wayne about twenty years ago where the first person I met, looking very fresh and spry, was Dr. Green, who had just covered the twenty miles from West Chester on his bicycle. Gentlemen, do you think we can accomplish a feat like that when eighty years of age? If we hope to, we must remember his advice of a year ago: "Do your best; then do not worry."

Dr. Green has not only been an honor to our society, but has been held in highest esteem by the people of West Chester, where he has been called to fill several positions of honor and trust. And now in closing, I wish on behalf of my fellow members to extend to him our thanks and gratitude for all that he has given us as a society, and to wish him many more years of health and happiness.

Dr. LUCKIE. We have now to hear from Dr. Green. He is the tip-top blue blossom of them all. I want to call attention to his likeness on the program. This photograph was taken on the 18th

of January last. Now, Dr. Green, we want to hear from you.

Address by Dr. Green.

Dr. GREEN. I do not know what to say, but I must thank the Chester and Delaware County Society for bringing me here to meet with them and be with them. It is always interesting to me to be with those I have known so well.

I might first give some reason for this organization. I do not know anything about dentistry, that is, the dentistry of today; but I knew dentistry some years ago, and I remember very well the time when we had not the advantages that we have now in the dental profession. I remember very well that in 1843, when I commenced the practice of dentistry, we could not have such a meeting as this. We could not tell our neighbor, if a dentist, what we had been doing. It would not do to tell anyone what we had done. It was all a secret society. I remember that a man from a neighboring town came in one day and said, "I want to know how to manufacture teeth." I said, "We do not tell anything about that to anyone else." He replied, "Well, I will ask Goddard." I said, "Go ahead." He came back later and said, "Those recipes of Goddard's are good for nothing." In 1838 I saw that very man grinding some sheeps' teeth at Marshallton in a carriage factory. He had obtained some sheeps' teeth, and was making holes in them in which to put pivots. What would you think of that today?

I remember one occasion when a dentist from West Chester brought a case and wanted to know how I would treat it. I told him. When my preceptor heard of this, he said, "Never do it again, for everyone will know as much as you do."

I knew Elisha Townsend very well. I knew old Dr. Daniel Neil. Dr. Townsend could put a filling of gold in a first or second molar, without any rubber dam around the tooth. Something like this was put into the roof of the mouth (describing a napkin-holder) to hold the napkin down. You do not find anyone

now using such a thing. I remember Dr. Townsend's saying, "I suppose I shall have to get out of practice, because I have the old way."

I remember signing the call for this society. I also signed the call for the American Dental Association and for the Pennsylvania State Dental Society. I attended all the conventions. The first that I attended was in 1855, in Philadelphia, at 10th and Chestnut sts, when the dentists met and formed the American Dental Convention. We had delegates from New Orleans to Boston. The next year we went to New York, and had a greater number than in Philadelphia. Dr. Chapin Harris was there, and I became acquainted with him at that time. Some thought that a convention did not amount to much, and decided to organize an association, and have representatives sent by smaller societies. That was done, and we succeeded in starting the American Dental Association. We made the S. S. White Dental Manufacturing Company's building, 528 Arch st., our headquarters when it came our turn to meet again in Philadelphia. We met in Boston in 1866, in the Representatives' hall, and had prominent men there. That was the first time I saw the electric mallet. I saw a man doing an operation with it, and thought I might as well have one.

I do not suppose a man here knows I had to pay a license to make a suction

cavity in a plate. I have my certificate from Dr. Gilmore, who made the cavity plate. I have it in my house, to show that I have the right to make them. We could not use vulcanite without a license. I went to Boston and paid my fee every year for permission to use vulcanite. They sent an agent around to everyone, to see whether they could find in our laboratories any evidence that we were using vulcanite.

I feel thankful to be among you all this evening; and thank you for your close attention to the few words I have said.

Dr. LUCKIE. Before we separate, I want to call attention to the service flag of the society. We have a membership of forty-four, and this shows that eleven have been in the service—twenty-five per cent. This flag was presented to the society by one of the members at the last meeting.

I want, on behalf of the society, to extend thanks to the ladies of the New Century Club for the delightful way in which they have entertained us. And I want to thank the visiting boys for being here, and helping to make this occasion a pleasant one.

And when we are done with our life-lasting toys,
Dear Father, take care of Thy children, the boys.

The society then adjourned.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDWARD C. KIRK, D.D.S., Sc.D., LL.D., *Editor.*

L. PIERCE ANTHONY, D.D.S., *Associate Editor.*

PUBLISHED BY THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Virgin Islands, Cuba, and Mexico. Canada, \$1.40. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the EDITOR, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, APRIL 1919.

EDITORIAL DEPARTMENT

Local Anesthesia in Dentistry.

WITH the demonstration of the conduction method of anesthesia in this country as applied to dentistry by Dr. Guido Fischer in 1912 by means of novocain, local anesthesia received an impetus which has eventuated in making it one of the most important advances made in dentistry in recent years.

Dr. Hermann Prinz first introduced the method of conduction anesthesia in dentistry by means of novocain in this country in 1907, just two years after the discovery of that drug by Einhorn and about a year after the adaptation to dental surgery by Fischer of the method devised by Braun, but it was not until Dr. Fischer's visit to this country in 1912 and his demonstrations of the method, that it was seriously accepted by the profession.

Dr. Prinz' demonstration, however, was by no means the first exhibition in the United States of the method of conduction anesthesia—which incidentally has for so long a time been consistently and erroneously called, in dentistry but not in medicine, “conductive” anesthesia. As far back as 1885, just one year after the report of the epoch-making experiments of Koller on the anesthetic properties of cocain, we find recorded in the DENTAL COSMOS, vol. xxvii, 1885, p. 208 *et seq.*, a report of a series of experiments with cocain presented before the New York Odontological Society by Dr. E. H. Raymond, which constitute what were evidently the first successful attempts at producing anesthesia by the conduction method. Dr. Raymond, a New York dentist, reports several experiments made by himself, and some by Dr. W. S. Halsted, professor of surgery in the Johns Hopkins University, which latter were evidently the first made, and which stimulated Dr. Raymond to extend the experiments with cocain as an anesthetic for dental purposes. In describing the method used by Dr. Halsted in producing anesthesia with cocain in one of the cases reported, Dr. Raymond says:

The syringe was charged with thirteen minims of a four per cent. solution of cocain, and the needle-point directed on a line extending about midway between the angle and the coronoid process of the inferior maxillary, passing through the internal pterygoid muscle. The finger being placed upon the internal oblique line as a guide, the syringe-needle was carried along the inner surface of the ramus until it reached the nerve as it enters the inferior dental foramen. A “tingling” sensation was produced in the bicuspid and incisors when the syringe was discharged. In three minutes the tongue began to feel thick and numb on the right side. In seven minutes there was almost complete anesthesia of the right half of the tongue and the gums around the inferior teeth. The excavator being applied to the cavity which was previously so tender, no sensation whatever was felt by the patient. I then used the engine with perfect freedom, and prepared the cavity for filling, without any discomfort to him. Although there was just a slight degree of sensibility in the bottom of the cavity, he said it amounted to nothing comparatively; he was just conscious that the instrument was there. The gustatory nerve, which lies near the inferior dental nerve at the point injected, accounts for the tongue being anesthetized. As the gustatory was not touched, this shows that it is not necessary for the needle

to penetrate the nerve substance. . . . The anesthesia lasted for about twenty-eight minutes, when normal sensibility returned. That evening at dinner there was some stiffness and a slight soreness in the muscles while masticating on the right side. The next morning there were no symptoms indicating that he had submitted to any unusual treatment.

The method used in another case reported was described as follows:

The syringe was charged with ten minims of a four per cent. solution of cocain, and the point of the needle carried under the upper lip on a line nearly parallel with and a little to the right of the cuspid eminence, keeping it near the body of the bone until the superior maxillary nerve was touched where it emerges from the infra-orbital foramen.

In speaking of the future of the method, Dr. Raymond made the following prophetic remarks, although it was many years before his virtual prediction was fulfilled:

That this method of using the agent will become generally adopted by the dental profession cannot now be foretold or foreseen. There seems to be no reason why it should not be, in cases of excessive sensibility of the teeth. Compared to all known methods for producing temporary and local anesthesia, this surely promises to take first rank. Its potency, its simplicity, and the marvelous localization in its range of action upon the nerve-trunks and tissues, coupled with its apparent safety, should make it the boon of boons to those requiring an anesthetic for the amelioration of physical pain.

It is interesting to note that some of these experiments were made on Dr. E. A. Bogue of New York, and upon the late Dr. Safford G. Perry of New York, and these were reported in the discussion of Dr. Raymond's paper.

Thus it will be seen that a method of producing anesthesia which was to revolutionize that phase of dental surgery was discovered many years before it was developed and accepted by the profession.

We present in our present issue what may be termed two more or less divergent viewpoints of local anesthesia in dentistry. one by Dr. Beck, in which he reports a long and successful use

of conduction and particularly infiltration anesthesia, and marvels at the small percentage of the profession which is availing itself of the wonderful benefits to be derived from the practice of local anesthesia; and the other by Dr. Blum, in which he reports a number of untoward results from the indiscriminate use of the method, and which we venture to offer as a partial answer to Dr. Beck's implied query as to why dentists are not using local anesthesia more generally in everyday practice.

There is not the least doubt as to the safety of the method in the hands of an expert such as Dr. Beck, and while his extensive and highly satisfactory experience with the method enables him to present it in a bright light, we must agree with Dr. Blum that the practice should be taken sufficiently seriously to impel the operator to thoroughly familiarize himself not only with the anatomy of the parts in which he is to make anesthetic injections, but also with the methods by which the injections have been most successfully made, and this prerequisite Dr. Beck fully indorses. Only recently have we had our attention called to several cases in which untoward though not serious results have arisen from the use of conduction anesthesia, two cases in particular in which the patients have complained of a lack of sensation in the mandible some six months after the injections were made. We do not believe that any serious result will follow in these cases, but it must be a source of considerable mental perturbation both for the operators and the patients. These fortunately rare cases we trust may be avoided when we have had more experience with the conduction method of anesthesia.

Conduction anesthesia may also be said to have given a very helpful impetus to oral surgery, and while it is not intended to take the place of nitrous oxid or general anesthesia for a great portion of oral surgical work, it has afforded some surgeons a more comfortable and leisurely method of operation, and hence one which has inspired the operator with a certain amount of confidence. The ease with which nitrous oxid and oxygen can now be given through the nasal passages removes the principal objection to the use of that agent as a general anesthetic for intra-oral operations; thus we have at our command both methods of anesthesia for oral surgical operations, and there is no doubt that both have their place in oral surgery, and the most successful

oral surgeon will doubtless be the one who uses both methods with proper discrimination.

The wide use of conduction anesthesia in the battlefields of Europe under conditions where general anesthesia was almost if not quite impossible is another of the varied applications of this method of producing anesthesia that have proven beneficial to the wounded soldiers and to the dental corps in its service to the army, and that have enabled dentistry to render a service to the wounded that could hardly have been rendered without the aid of conduction anesthesia.

The Victory Liberty Loan.

WE take pleasure in presenting to our readers the accompanying appeal from the Victory Liberty Loan Committee to the dental profession, in the assurance that it will meet with a generous response.

Dentistry has received full recognition from the Government in its recent war activities, and we feel sure that the profession will profit by this opportunity to in a measure express its approval of the war efforts of the Government on behalf of the cause of humanity in a substantial manner. Let us all do our share in helping to pay the price of victory.

From the Victory Liberty Loan Committee

PROFESSIONAL men whose services during the war were of incalculable value to the Government are to be called into action once again; this time to help float the Victory Liberty Loan to be offered in April, which is to pay the price of Victory.

Readers of the DENTAL COSMOS know that whatever its cost in dollars and cents, the price is cheap. Dentistry's representation in the war effort has been relatively as large as that of any other calling. Dentists have had opportunity to see the war sacrifices made by American soldiers, and to appreciate the fact that in comparison the greatest self-denial on the part of those who remained at home is little.

It is not only in taking its full quota of the Victory Liberty Loan that the Government will need the aid of the profession;—

no one doubts that this will be done with the same loyalty as though hostilities were still in progress. It is in carrying the message of enduring patriotism to all with whom they come in contact that dental workers can be of the greatest aid.

For instance, not every American stops to think of the lives saved by the speedy ending of the war. Army statistics show that, at the rate of deaths maintained during the period the American Expeditionary Force was abroad, one hundred thousand additional American lives would have been sacrificed if the war had continued until May 11.

The Victory Loan will be used in great part to pay our war bills. This does not mean munitions alone. It includes insurance payments to the dependents of soldiers who gave up their lives, pay for the men still in the service, and similar items, as well as settlement of claims of canceled contracts.

Comparatively few Americans know what has been obtained by the Government for the money spent in army equipment, bills for which will be paid out of the Victory Loan. With only one more delivery of about 150 earloads of supplies now on their way to the Government storehouses, the United States will have on hand sufficient equipment to supply in every detail two entire field armies, aggregating 2,400,000 men. And this in addition to the mountains of supplies sent abroad.

Talk to your patients, your friends and acquaintances, and see that they are thinking rightly. Every American who is brought to a realization of the tremendous task accomplished by the Government will take his share of subscriptions to the Victory Loan.

THE COMMITTEE.

BIBLIOGRAPHICAL

A TEXTBOOK OF GENERAL BACTERIOLOGY. By EDWIN O. JORDAN, Ph.D., Professor of Bacteriology in the University of Chicago and in the Rush Medical College. Sixth Edition, thoroughly Revised. Octavo of 691 pages, fully illustrated. Philadelphia and London: W. B. Saunders Co., 1918. Cloth, \$3.75 net.

The present edition differs but little from the preceding editions, which have gained for this work a rank among the first American texts. To quote the preface, the chapter on the *Pneumococcus* has been entirely rewritten, and that on the *Meningococcus* extensively revised. Several new sections have been added, including brief summaries of our present knowledge of infectious jaundice, rat-bite fever, and trench fever.

The chapter on the *Streptococci* needs extensive elaboration and some revision. In particular it should be brought into close co-ordination with the chapter on the *pneumococci*, to correspond with the close biological affinities of these groups. The modern studies which have been fostered by the widening appreciation of the significance of focal infection are by no means adequately reflected. There is no other group which surpasses that of the *streptococcus-pneumococcus* group in its import to the dental profession.

It is difficult to admit the validity of the word "general" in the title. No exception can be taken to the short chapters on "Bacteria and the Nitrogen Cycle," "Bacteria in the Arts and Industries," "Bacteria of the Air, Soil, and Water,"

and "Bacterial Diseases of Plants"; but the mere inclusion of such sections does not constitute a *general* treatment of the subject. Agricultural and industrial bacteriology and phytopathology are as much special applications or arts as medical bacteriology. The book in its entirety is patently a student's text pertinent to human pathology, and in no sense, either in content or treatment, a work on general bacteriology. As one of a number of texts to be consulted by the medical or dental student in conjunction with their lecture and laboratory work, this book will be of value as it has been in the past.

The form and appearance leave nothing to be desired. The illustrations are well chosen and excellently reproduced.

Books Received.

Books received are acknowledged in this column, and such acknowledgment must be regarded as a sufficient return for the courtesy of the sender. Selections will be made for review in the interests of our readers and as space permits.

"Modern Dentistry for the Laity and Industrial Dentistry for the Corporation." By ALFRED A. CROCKER, Cincinnati, Ohio, 1918. Published by the *Dental Register* (founded 1847, pioneer dental journal of the United States), Cincinnati, Ohio.

"Roentgen Diagnosis of Diseases of the Head." By Dr. ARTHUR SCHULLER, Head of the Clinic for Nervous Diseases at the Franz-Joseph Ambulatorium, Vienna. Authorized translation by FRED F. STOCKING, M.D., M.R.C. With a foreword by ERNEST SACHS, M.D., Associate Professor of Surgery in Washington University. Approved for publication by the Surgeon-general of the United States Army. St. Louis: C. V. Mosby Co., 1918. Price \$4.00.

PRACTICAL HINTS

This Department specially welcomes the brief presentation by our readers of any novel suggestions or methods which in their own practice have proved to be time-saving or to possess other features of advantage.

A "Teaser" for Gold Soldering.

By V. H. McALPIN, D.D.S., Warren, Pa.

As a teaser in soldering gold work, I have for over a year been using a $1\frac{1}{4}$ in. 19-gage gold-coated tungsten wire, ground bare upon the end to a fine needle point. This wire is soldered into a piece of seamless nickel-silver tubing about two inches long, which in turn is forced into a wooden handle four inches long.

This short teaser is good for small

soldering; a longer one should be used for large work.

The beauty of this teaser is, that it rarely attracts solder, which falls away upon heating. Pure gold only seems to stick a little. The needle point is no great thief of heat, and cannot be melted down. The point can be made so delicate as to draw solder into very small crevices.

The X-Ray as a Positive Diagnostic Aid.

By ABRAHAM LEVINE, D.D.S., New York City.

THE patient, a woman of about thirty-five years of age, presented herself at the hospital complaining of paroxysmal pains of a lancinating character, involving the left maxillary region. She also complained of a dull headache. Upon examining her mouth, I noticed that she had an ill-fitting bridge, extending on the left side from the canine to the first molar, the two bicuspid being crowned, the canine and molar being replaced by porcelain facings. To outward appear-

ances everything seemed to be normal, but upon radiographing the region a piece of root was found in the process, upon which the canine facing was exerting excessive pressure. The radiograph also showed the first bicuspid to be abscessed. The bridge was immediately removed, as were the fractured root and the abscessed tooth. The patient was then discharged.

A week later the patient returned, stating that she was relieved of the sharp

pains, but that she was still subject to dull headaches. Another radiograph was taken in a more anterior position, and this showed an impacted canine lying in a vertical position immediately over the

apex of the left lateral incisor. Under conduction anesthesia the impacted tooth was removed, and since that time (over a month ago) the patient has never complained of any pain.

REVIEW OF CURRENT DENTAL LITERATURE

[*British Journal of Surgery*, January 1919.]

Displacement of the Mandibular Meniscus, and Its Treatment. BY J. HOGARTH PRINGLE.

This condition is rare. As in the knee-joint, so in the mandibular articulation, displacement of the meniscus is the result of some sudden movement of the joint. The accident is the consequence in almost every instance of a sudden and generally excessive action in closing the mouth, such as occurs in the free gratification of an inclination to yawn or sneeze.

Pringle would correct the usual description of the disk in the following sense. Invariably there is a very decided central thickening of the disk, situated in its coronal plane over the summit of the condyle. In front of this ridge there is a distinct depression in the disk, which fits the *tuberculum articulare* of the temporal bone, while below this and anterior to it there is a second thickening, which forms the anterior border of the disk and has the external pterygoid muscle attached to its lowest part. These two thickenings, with the intervening depression, give the superior surface of the disk its typical concavo-convex outline as seen from the lateral aspect, fitting it accurately to the sinuous articular surface of the temporal bone. The posterior portion of the disk tails off from the thick coronal ridge, and lying in close contact with the posterior surface of the condyle, becomes lost in the fibrous tissues of the capsule of the joint.

Pringle has experienced this dislocation

himself, and has seen 4 patients, 2 of whom attributed their disability to violent tooth extraction under general anesthesia. The symptoms are extremely acute pain at the moment of displacement of the meniscus, and thereafter whenever mandibular movements are attempted. When one attempts to close the jaws, he is unable to bring the teeth on the affected side together; there is a definite feeling of a something which prevents the joint from flexing completely; mastication is difficult.

Method of reduction. Pringle managed to get the meniscus back into position by keeping up hard pressure at the back of the condyle with the mouth open, and slowly closing the jaw. Sometimes this process has to be repeated several times, but eventually, as far as Pringle's experience goes, it is invariably successful. In some cases there is after the first accident a predisposition to frequent recurrence, for the treatment of which it may be necessary to resort to surgery (suturing the "loose" disk to the periosteum or excision of the meniscus).

[*Surgery, Gynecology, and Obstetrics*,
Chicago, March 1919.]

Foreign Bodies in Air and Food Passages. BY CHEVALIER JACKSON.

This is an analysis of 628 cases. It is significant that, of this number, specific reference is made to but four cases of dental interest:

Case 387b. A root-canal reamer (photograph looks like a Kerr broach). This had been for seven days in a right inferior lobe

bronchus. Removed by peroral bronchoscopy in 32 seconds. Cure.

Case 552. Same object as above, in upper left lobe bronchus for three months. Removed in same manner. Cure.

Case 625. Same object as above, in right middle lobe bronchus for two days. Removed in same manner. Cure.

Case 574. An amalgam tooth-filling, in the left bronchus for two weeks. Peroral bronchoscopic dilatation of annular edema, to remove body, accomplished in 7 minutes, 54 seconds. Cure.

Local anesthesia was used in all four cases.

[*Annals of Surgery*, Philadelphia, January 1919.]

Operative Treatment of Hare-lip and Cleft Palate. BY JAMES H. NICOLL.

This article, which presents the author's technique very concisely, closes with the following admonition, of some dental import: In cases of alveolar hare-lip the patient after operation should be placed under the observation of the dentist. Too often, when the date arrives, faultily erupting teeth, deciduous or permanent, are ruthlessly extracted. Such extraction not only sacrifices the tooth or teeth, but leads to atrophy and non-development of the portion of the alveolus bearing the empty tooth sockets.

[*Le Progrès Médical*, July 1918.]

The Complications of Vincent's Infection of the Oral Mucosa. BY LÉON TIXIER AND TOBÉ.

These authors in three years' experience at the front have had extensive opportunities along the line of pathology suggested by the title. Usually the constitutional manifestations of this condition are regarded as insignificant. (See DENTAL COSMOS, December 1918, p. 1160.) However, numerous forms of the erythemata, enlargement of the lymphatics of the parotid and cervical regions, albuminuria, pericarditis sicca, inflammatory reactions of the pleural, articular, and meningeal serous linings, pulmonary complications (from simple bronchitis to broncho-pneumonia), adrenal insufficiency, sensorial disturbances, iritis, keratitis, have been noted in a certain number of cases.

The validity of associating the fuso-spirillary stomatitis with the pathogenesis of these lesions (in other words, the relations of cause and effect) appears to the authors undeniable. For this view they find clinical proofs in the parallelism which exists between the intensity of the stomatitis and the gravity of the lesions elsewhere in the body. For example, a reappearance of an erythema has always been preceded by an exacerbation of the stomatitis. This form of reasoning is very inconclusive, and no evidence than that mentioned above is to be found in the original. This parallelism is perhaps more easily explicable in terms of the concept elaborated by Duke (DENTAL COSMOS, February 1919, p. 182); for instance, "When a person has several infections, each may increase the severity of the others, whether due to the same or different infecting organisms."

The local treatment does not essentially differ from that repeatedly described. Attention is given to the fact that the oral cavity as a whole must be brought back to a state of health before success can ensue. Under local treatment the stomatitis disappears in a few days, although it may have to be continued for some time before an examination for the micro-organisms will be negative. General treatment should be instituted when the oral lesions are particularly extensive, and when they are accompanied by complications. Intravenous injections of neosalvarsan or of galyl are remarkably efficacious. This medication should be given very early, as the complications are not rare in the severe forms of stomatitis. Slight albuminuria is not a contra-indication for the administration of this treatment.

K. Henschen (*Schweizerische Vierteljahrsschrift fuer Zahnheilkunde*, 1918, xxviii, No. 3, p. 176) calls attention to a case in which a chronic periosteitis, caused by the fusiform bacillus, simulated a sarcoma of the mandible. The patient was a boy of six and one-half years. The swelling had grown in the course of eight weeks to considerable size. Trismus eventually set in. Puncture permitted the outflow of a thick, whitish pus, with an odor like the exhalations of putrefying hay. Bacteriologically the *B. fusiformis* was found in pure culture. The swelling returned later, to yield to applications of a salve.

[*Proceedings of the Society for Experimental Biology and Medicine*, New York City, November 20, 1918.]

On the Antiseptic Action of Benzyl Alcohol. BY I. D. MACHT AND D. E. NELSON.

Benzyl alcohol (phen-methylol) is used as a local anesthetic. If in a pure state it be injected subcutaneously or intramuscularly, it produces necrosis, but the slough was invariably sterile in character. Bacteriological studies and a large number of clinical histories confirmed this inference of an antiseptic action. A study of over 200 post-operative histories of patients on whom operations were performed with the use of benzyl alcohol as a local anesthetic showed in all cases that the wounds healed rapidly without any infection. In all the above cases the concentrations of the benzyl alcohol employed ranged from 0.5 per cent. to 4 per cent. (never noticeably irritant to the tissues). None of the other commonly used local anesthetics (cocain, novocain, alypin, etc.) can be said to possess antiseptic properties. It is therefore interesting to call attention to the antiseptic properties of benzyl alcohol as a desirable concomitant of its anesthetic action, especially in anticipation of the possible application of this drug in oral and dental surgery, in a region in which infection is so well-nigh omnipresent.

[*Journal of the Allied Dental Societies*, December 1918.]

Some Biological, Physiological, and Clinical Problems in the Treatment of Oral Septic Foci. BY T. SYDNEY SMITH.

This article purports to offer histological evidence that the soft tissues which have been separated from the roots of teeth by pyorrheal destruction may form a vital reattachment and rapidly and permanently cure the lesions, *if the teeth are living*. Based upon the premises thus reached, Smith recommends certain clinical procedures which will permit and facilitate this reunion.

The school of dental practitioners who deny the possibility of such reattachment bases its argument upon the assumption that when the cementum is denuded of the periodontal membrane it becomes deprived of its sole source of nutrition, therefore becomes necrosed, and open to unlimited bacterial in-

vasion. It is inconceivable that this necrosed and infected cementum could afford attachment to living tissues. The crucial point of this argument is the assumption that detachment of the periodontal membrane deprives the cementum of an indispensable part of its nutrition, and it is just this point which Smith attacks.

His contention is that the cementum receives nutriment from the pulp as well as from the pericementum, and therefore when separated from the pericementum it does not die, as long as the pulp remains vital. He would support this view by the totally inconclusive observation that there is nothing in the structure of the cementum (not even the first-formed, very compact lamellæ) which *a priori* would make inconceivable an osmotic transmission of nutriment through the cementum from the pulp. The truth of this observation will not be denied, at least it has not been disproved; but its pertinence to the central question of its reality and of its adequacy to maintain cementum "vital" is distant. It is conceivable, assuming the structure of cementum to be such as Smith describes, that nutriment might pass through osmotically from the pulp, but conceivability and actuality are not invariably synonymous. In short, Smith's contention is based on an opinion, a personal interpretation, of no more weight than the opinion upon which the opposite school bases its views.

Both schools seem to agree that reattachment cannot occur unless the cementum be "vital," and that the most conclusive evidence of this vitality would be the actual demonstration of an anatomical and physiological reattachment of the periodontal membrane to the cementum.

Clinically, Smith's views are less open to exception. He finds that three conditions, above all others, prevent the tightening of loose teeth—*i.e.* a physiological "reattachment": (1) The infolding of the epithelium along the gingival wall of the pocket; (2) enough destruction of the soft tissues to prevent them from remaining close to the cementum while healing is taking place; and (3) the removal or destruction of the cementum from the radicular portion of the tooth. The only method suggested of obviating the first obstacle is to let the tissues reunite as far as possible after the first oper-

ation, and then occasionally to freshen surgically the tissues at the bottom of the remaining shallow pocket. During instrumentation the greatest care must be exercised against subjecting the soft tissues of the pocket to any unnecessary irritation and injury. They should be treated with the greatest delicacy. Smith is emphatically against the practice of reducing the depth of the pocket by cutting away some of the overlying unattached marginal tissue. It is obligatory to retain a layer of cementum over the root of the tooth. In Smith's opinion reattachment will not occur between the periodontium and the naked dentin. Where the cementum has been removed, he believes that it must be regenerated over that area of dentin before the process of reattachment can be initiated. Cementum may be removed by careless or over-zealous instrumentation, and it may be destroyed by the products of microbic activity.

Smith is convinced that the hindrance to reunion after surgical treatment is a local rather than a systemic one. The trouble invariably proves to be either in the gum or in the tooth tissues themselves. Even in cases of advanced diabetes or pernicious anemia the soft tissues have "reunited" to the roots when the local conditions were favorable.

Soft tissues do not reunite perfectly to pulpless teeth. However, if the pockets are not very deep, pulpless teeth can be improved sufficiently to make it advisable to retain them when the apical conditions are favorable.

[*American Journal of Surgery*, February 1919.]

Dead Teeth. BY JOSEF NOVITZKY.

During the past few years Novitzky has frequently emphasized the potential dangers of retention of devitalized teeth. He has developed a special surgical technique, considerably more elaborate than the usual extraction, for their removal together with the adjacent affected parts. (See DENTAL COSMOS, December 1917.) In the present paper he presents some laboratory considerations in support of his attitude. His argument in brief is somewhat like the following: The necessity of surgical removal of dead tissues is axiomatic; if the devitalized tooth be in this same sense a dead structure, it must be

removed. The purpose of this article is to adduce proof that teeth whose pulps have been destroyed by disease or by dental intervention are "dead" teeth, structures whose pathologic liabilities far outweigh their cosmetic or functional assets.

When the dental pulp has been removed and the apical foramina closed, the only possible nourishment to the tooth would be by means of or through the cementum. Against this possibility is the contention of Hopewell-Smith and others that normal cementum is structureless. This view has been corroborated by Novitzky's own laboratory investigations. Although the correctness of this conception of the anatomical conditions be indubitable, it is difficult to repose absolute credence in the inference therefrom that these conditions preclude the possibility of the maintenance of some degree of vital environment for the dentin, by a transemental pathway. This argument is at best *a priori*.

In this connection, the views of Smith (*Journal Allied Dental Societies*, Dec. 1918. see *supra*) are of interest. His problem is like Novitzky's, that of the vitality of dental tissues deprived of their normal avenue of nutrition. For his answer he resorts to a histological study of the cementum, which Smith interprets as indicating, as an at least theoretical possibility, that this tissue may in the absence of the periodontal membrane derive adequate nutrition for the maintenance of "vitality" via osmotic transmission from the pulp. By a histological study of cementum Novitzky decides that this tissue is impermeable to nutrient juices; going in the other direction, from the pulp out, Smith, likewise on the basis of the histology of the cementum, decides that this tissue is permeable to nutrient juices. In both cases, Novitzky's and Smith's, the directly opposite conclusions are based on essentially the same data; and in both instances the conclusions are opinions inseparable from the personal equation. This criticism is not to be taken in the sense that both opinions are wrong. It is likely that one is a statement consonant with reality. But the reality has not been demonstrated by the evidence presented in either of these two cases.

However, Novitzky does present direct and far stronger evidence for his view than the evidence to which reference is made above.

His conclusion that all devitalized teeth are dead teeth and subject to the laws of infection and putrefaction has been drawn from careful pathological examinations of hundreds of devitalized teeth. Of these, there was not one which, six months after devitalization, did not show unmistakable evidence of infection. One specimen, specifically referred to, was that of a tooth which had been boiled before replantation—a sterilization more thorough than could be hoped for through the root-canals. Two years later it was found to be thoroughly septic.

The evidence of the hundreds of devitalized teeth referred to in the above paragraph is a direct challenge to current dental procedure. If corroborated as a generality, the logic of Novitzky's argument becomes unassailable, in so far as concerns the necessity of the removal of devitalized teeth. But the desirability, even in that case, of removing them by Novitzky's method, is a different matter.

[*Lancet*, London, January 4, 1919.]

Infantile Scurvy. BY A. HARDEN, SYLVESTER S. ZILVA, AND G. F. STILL.

Lemon juice has long been recognized as a powerful antiscorbutic. The authors have shown that after removal of the free citric and other acids from the lemon juice, the residue retains antiscorbutic activity. As far as can be detected by the methods now available for the quantitative estimation of antiscorbutic potency, the main if not the entire antiscorbutic potency of the juice is retained by this residue, which is slightly acid to litmus, but can be made neutral if desired, without vitiating its potency. With precautions as to temperature this preparation can be concentrated in bulk to any desired volume, or even evaporated down almost to dryness without losing its potency as an antiscorbutic.

In the case of infants, the antiscorbutic dietary (orange juice, grape juice, powdered potato) is subject decidedly to limitations imposed by the tolerance of the patient. The preparation above described would seem to promise the elimination of such limitations. Four case histories are briefly given. The outstanding feature of this treatment was the use for the first time clinically of the antiscorbutic factor, separated from the greater

part of the inactive components of the foodstuff in which it occurs. Moreover, this antiscorbutic factor was given in concentrations at least twice—in one case seven times—as strong as that in which it occurs naturally in the foodstuff (lemon) from which it was obtained. The treatment was thus, so to speak, "intensive." The result was found to be an extremely rapid amelioration of the symptoms. This increased rapidity of improvement is not due to anything new in the essential element of the treatment—in the so-called "antiscorbutic factor." This was the curative principle in the ordinary antiscorbutic diet just as much as in this preparation. The difference is that in the experimental preparation the unessential and irritant part of the foodstuff has been eliminated and the antiscorbutic factor left in an aqueous medium associated with little extraneous matter, and this, even when considerably concentrated, seems to have no irritating effect upon the stomach or bowels. In ultimate completeness of cure this mode of treatment offers no advantage over the ordinary antiscorbutic foods, which only more slowly secure an equally satisfactory result, but it is no small matter if the relief of the very acute distress caused by infantile scurvy can be hastened even by a few hours.

[*Medical Record*, New York, February 15, 1919, p. 299.]

Treatment of Tumors of the Upper Jaw with Cautery. BY J. C. BLOODGOOD.

The mortality has been distinctly decreased with this method, and when cures have been accomplished it has been with less mutilation. Whether the actual number of cures has been increased cannot be demonstrated at the present time. The reduction in mortality is associated with the employment of local anesthesia alone, or in combination with light chloroform general anesthesia. In many instances it is safer to remove the disease involving the upper jaw in stages. In some of Bloodgood's cases there had been as many as fourteen operations.

The new growth should be attacked with the cautery from two points. One should burn the tissue at the border of the tumor. This not only destroys the infiltrating area, but excites in the healthy tissue beyond a granulation tissue which of itself is largely

protective against secondary invasion, at least during the period of complete removal. The second attack should be upon the neoplasm itself—if possible, from the center out.

[*Pennsylvania Medical Journal*, Athens, February 1919.]

Treatment of Malignant Disease by Combined Methods. BY GEORGE E. PFAHLER.

At least four methods have proved to be of distinct and positive value in the treatment of malignant disease (surgical excision, electro-thermic cautery, radium therapy, and roentgeno-therapy). This paper is written with the hope of influencing the profession to combine two or more of these methods. By certain skilful combinations, Pfahler is sure that many cases which now are ultimate failures may be made successes.

Among the conclusions the following are of dental interest: (1) All superficial epitheliomata should be cured. (2) Practically all early epitheliomata of the lower lip get well. (3) Most of the epitheliomata within the mouth, if treated early, may be expected to get well. If treated late, the results will be proportionate to the delay in instituting thorough combined treatment. (6) If the precancerous lesions, *e.g.* warts, moles, slowly healing ulcers, fissures, and benign tumors are eliminated early, the number of carcinomata needing treatment will be tremendously reduced.

[*Schweizerische Vierteljahrsschrift fuer Zahnheilkunde*, 1918, Bd. xxviii, No. 3.]

The Process of Resorption Occurring in Teeth in Dermoid Cysts. BY ED. MAR- THALER.

This is a very careful and intensive study of one phase of the pathology of teratomatous teeth. A satisfactory analysis of the literature serves to orient the reader, although no reference is made to the excellent English summaries. The particular question which Marthaler attacks is whether or not these teeth exhibit true dental caries. The importance of this question is more than purely academic, because the demonstration of the occurrence of this lesion would *ipso facto* prove that the primary condition and essential nature of dental caries are intrinsic, and not dependent upon the oral environment.

The material for this study was furnished

by an ovarian cyst, from a woman of thirty-eight years. The fluid contents were weakly acid in reaction. Three teeth were found, which especially on their occlusal surfaces showed decalcified areas, chalky in appearance, and honeycombed. The most interesting observation, however, was a cavity on the occlusal surface of one of these teeth, which superficially recalled dental caries. This cavity did not communicate with the pulp chamber. However, the dentin was not discolored, and was still normally hard, without a suggestion of the so-called leathery decay. In this same tooth a second cavity is to be seen, much larger than the first, extending along the side of the tooth from the amelodentinal junction to the apical region, and standing in communication with the pulp chamber. A ground section of this tooth was made for microscopic examination. The enamel was normal. Structural defects were not noticed in the dentin. Microscopically the margins of the enamel, dentin, and cement bounding the cavities show lacunæ morphologically identical with the classical Howship's foveolæ, typical of resorption of the hard tissues. The apical portion of the larger cavity has been refilled secondarily with an atypical cementum, with lacunæ. In repeated and most careful examinations, Marthaler was unable to discover bacteria. In this particular case, at least, he is certain that the resorptive organ is derived from the elastic tissue covering the teeth, and not from the pulp.

The evidence adduced in this contribution can only be interpreted against the view that dental caries occurs in teratomatous teeth. This conclusion is by no means new, having been for years the consensus of opinion of those best qualified to judge. (See Hopewell-Smith, 1918, "The Normal and Pathological Histology of the Mouth," vol. ii, p. 469. Blakiston, Philadelphia.)

[*Proceedings of the Society for Experimental Biology and Medicine*, New York City.]

Preliminary Report on the Behavior of Certain Local Anesthetics. BY CARY EGGLESTON AND ROBERT A. HATCHER.

The local anesthetics mentioned are cocain, procain, stovain, and apothasin. The fatal intravenous dose of each of the several substitutes for cocain varies enormously with

differences in the rates of injection. The subcutaneous doses show even wider variations among the different drugs than the intravenous doses. These anesthetics are mutually and quantitatively synergistic. They are all synergistic with epinephrin in its effect upon blood pressure in a manner analogous to cocain. The systemic toxic actions of all the members of the group are very closely alike, and all cause death in cats by combined paralysis of the heart and respiratory center. The previous administration of ouabain permits recovery from 150 per cent. of the fatal dose of procain when artificial respiration is employed.

[*British Journal of Surgery*, January 1919.]

Cancer of the Tongue. BY D'ARCY POWER.

Cancer of the tongue presents several peculiarities which make it worthy of consideration. It is an almost entirely human disease, always primary, always of one type (squamous-celled carcinoma), unknown in children, becomes frequent between the ages of forty and sixty (until lately it has diminished in frequency in extreme old age), common in men, rare in women, not associated with any inherited predisposition to cancer. *A propos* of its zoölogical distribution, the net result of Power's investigations is that one horse, three aged cats, and one old dog are known to have died of lingual cancer. History appears to show that until the seventeenth century lingual cancer was as infrequent in men as it now is in animals.

It is clear from historical and statistical evidence that this neoplasm is increasing in frequency, and at the present time it is increasing more rapidly in men than in women. The statistics in general were furnished by the Registrar-general of Great Britain.

Irritation is thought to be an important factor in the causation of cancer, and Power has therefore tried to ascertain whether the state of the teeth has altered materially since cancer of the tongue became rife, because many patients state that injury of the tongue by a tooth was the origin of the cancer. Approaching this problem from the standpoint of comparative pathology, it is clear that while pyorrhea may act as a source of irritation to the tongue, it is only of minor importance in producing cancer, as otherwise

cats and dogs (in which species periodontal disease is extremely prevalent) should be affected much more often than actually is the case. Power likewise decides that dental caries seems to be only of slight importance as a factor in causing lingual cancer. His bibliographical and historical researches seem to indicate that dental caries was as prevalent in Romano-British times as it is among the modern Londoners. A fallacy lies in the smallness of the numbers under consideration, but if it be assumed for the sake of argument that they are substantially correct, the conclusion must be drawn that, while the number of cases of caries has not increased, there has been a very rapid increase in cases of lingual cancer. Dental caries is therefore not an important factor in causing carcinoma of the tongue.

The history of this latter condition calls attention to two factors, syphilis and tobacco, which are studied historically and statistically. Power thinks that the following conclusions can be safely arrived at from the evidence presented in this article: Cancer of the tongue has always existed both in men and other animals, the actual cause being as yet unknown. Its rapid increase in men within historical times is the result of two causes—(1) predisposing and (2) exciting. The predisposing factor is a degenerative change taking place from spirochetal (syphilitic) infection, the change being accentuated by lapse of years and by indulgence in alcohol. The form in which the alcohol is taken seems unimportant; it is the amount consumed which matters. The exciting factor is a local irritation. The most important local irritant is tobacco, although pyorrhea and carious teeth often act as minor exciting causes.

The association of syphilis and excess in tobacco and alcohol in the history of cases of leukoplakia buccalis and the ultimate carcinomatous degeneration of this lesion serve to strengthen Power's conclusion upon these same factors as predisposing and exciting agencies of lingual cancer.

In conclusion, primarily it should be possible to reduce lingual cancer to the subordinate position which it occupied before the seventeenth century in men, and which it still occupies among the domesticated animals. At the present time syphilis is more

prevalent than it has been for many years, and the consumption of tobacco has enormously increased; also women now smoke on a larger scale than they used to do. If matters are allowed to continue in their present course, there will be a huge increase in the number of cases of lingual cancer. The increase should begin about 1950 A.D., and should affect women as well as men.

Such an increase can be prevented by a thorough and systematic treatment of syphilis in its initial stages. Persons who are being treated for syphilis should never smoke, not drink to excess, and pay regular visits to a dentist in order that their teeth may be kept in the best possible state, and that any dentures which they may need to wear should be maintained well fitted and free from rough edges. (Cf. C. Everett Field, opposite page.)

This is a most excellent article. It presents a wonderful fund of historical, statistical, and clinical information upon lingual cancer, syphilis, and tobacco.

[*Medical Record*, New York City, February 22, 1919.]

Study of Some of the Etiological Factors Bearing on the Therapeutics of Bell's Facial Palsy. BY JOSHUA H. LEINER.

As a result of a review of 177 cases, the author came to the following conclusions:

(1) Bell's facial palsy occurs comparatively more often on the right side; this is shown both anatomically (the right stylo-mastoid foramen was usually narrower than the left) and clinically.

(2) It occurs twice as many times in the female as in the male.

(3) It occurs more often between the months of April and September, inclusive—the "open-window season."

(4) Because of the last-mentioned fact the primary etiological cause is exposure, and this factor also enters in those cases occurring in the winter months.

(5) Counter-irritation should be the earliest and proves the most efficacious remedy, if the case be a primary facial palsy.

(6) All electricity should be immediately stopped when the first symptoms of contracture appear.

(7) Electricity (galvanism) is the only treatment in chronic cases, and should be employed even up to one year after the onset

of the paralysis, providing there is no tonic contracture of the musculature. Leiner has seen cases that have recovered after a full year's treatment.

[*Proceedings of the Society for Experimental Biology and Medicine*, New York City, November 20, 1918.]

Studies on the Amyolytic Activity of Human Saliva with a New Method.

BY VICTOR C. MYERS AND ANNE G. DELLENBAUGH.

The technique of the method is as follows: A specimen of mixed saliva, secured from the stimulus of chewing paraffin, is filtered, and a small portion accurately diluted 1:100 with distilled water, and also another portion with 0.3 per cent. NaCl as an activating solution. Mix thoroughly. Place with pipet 1 cc. of the diluted saliva in a test tube, in a water-bath at 40° C. After five minutes add 1 cc. of a 1 per cent. solution of starch. Incubate thirty minutes. Add 3 cc. saturated picric acid solution and 1 cc. of a 20 per cent. Na_2CO_3 solution. Place tube in boiling water for fifteen to twenty minutes. Allow to cool. Dilute with distilled water in an accurately graduated cylinder until the intensity of the color approximates that of the standard (glucose in picric acid treated with Na_2CO_3 and heated), after which it is compared with the standard in the colorimeter. After correcting for the reducing power of the starch solution, the activity is recorded in terms of percentage of starch converted to reducing sugar.

With this method amyolytic activity was demonstrable at a dilution of 1:400 when water was used as diluent, and at 1:2000 when 0.3 per cent. NaCl was the diluent.

The method has been applied to a considerable number of normal individuals, the activity in the majority of cases falling between 30 and 45 when water was the diluent. With 0.3 per cent. NaCl diluent most of the figures fell between 46 to 50, suggesting the possibility that in some individuals a considerable part of the ferment is secreted in the zymogen form. Figures obtained from the same individuals at the same time of day agree very closely. The activity has been tested on representatives of a number of nationalities, and found to vary within essentially the same range as above. The same was true

of a number of pathological cases, including such conditions as diabetes, nephritis, and gastric ulcer. Several individuals were encountered who for periods showed low activities with figures from 10 to 20. Some of these had suffered persistently from gastric distress, others were suffering from acute infections. With this method it is possible to demonstrate a considerable decline in the activity of the saliva as a result of the glandular fatigue produced by the continuous secretion of saliva during paraffin-chewing. Likewise the method is a very suitable one to employ in demonstrating the diurnal variation.

[*British Medical Journal*, January 18, 1919.]

Bone-grafting in Fracture of the Mandible. BY PERCIVAL P. COLE AND CHARLES H. BUBB.

The authors had their attention focused on the pedicled graft. The conditions necessary to permit performance of this operation are—(1) Site of fracture (the lesion must be situated at or in front of the angle of the mandible). (2) Usually the gap should not exceed 4 cm. (but success has been accomplished even when the gap was 7 cm.). (3) The soft tissues of the submaxillary triangle must be free from scar tissue on the side from which the graft is cut.

Their experience is summarized in the following table:

Operation.	No. of cases.	Result known.	Failure.	Success.
Plating	2	2	2	0
Wiring	20	20	1	19
Pedicled graft . .	34	23	2	21
Free trans-plant	12	10	3	7
Operation abandoned . . .	3	3	3	0
Total	71	58	11	47

(19 p.c.) (81 p.c.)

[*Pennsylvania Medical Journal*, Athens, December 1918.]

One Hundred Cases Treated with Autogenous Vaccine. BY W. A. WOMER.

Out of these one hundred cases, only five are pertinent to dental problems. There were two cases of infection of the accessory sinuses discharging into the nose. They had

both been thoroughly treated, but continued to discharge freely, one of them for six months. This case recovered after twelve treatments with an autogenous vaccine; the other case, less severe, after five treatments.

The three cases of pyorrhea may be summarized as follows: (1) Duration of one year, very extensive; complete recovery followed four injections of the vaccine. There is no mention of instrumentation or other local measures. (2) Duration of one year, very extensive; no improvement even after twenty-nine injections, and in spite of synchronous dental treatment. (3) Duration of a number of years, moderate in extent and severity; recovery after fifteen treatments. There is no mention of any local measures.

[*Medical Record*, New York, February 15, 1919.]

False Teeth as a Cause of Cancer. BY C. EVERETT FIELD.

The author has particularly in mind the chronic irritation to which the delicate oral mucosa (especially alveolar and palatal) is subjected by badly adapted artificial dentures. The basis for this report is a minute analysis of a series of 87 clinical cases coming under the observation of the author during the past three years. This was supplemented by an exhaustive study of the available literature on the subject. Of a classified series of 157 cases presenting malignant processes involving either the maxillary or mandibular regions, 87 presented a clinical history that showed the initial ulceration or nodule to be in close proximity to an artificial denture of which the patient complained. Fifty-eight cases had paid little attention to oral hygiene, and had allowed existing plates to remain in filthy condition. Of the 87 personal cases, 52 were in men (28 of whom were heavy smokers), and 35 were in women. Of the 87 cases, 19 showed original development of the malignant lesion adjacent to bridge work and 68 near plate work of various types. In 59 cases the malignancy was present in the maxilla, in 28 cases in the mandible. The tumors were classified as follows: Carcinoma 65, sarcoma 9, osteoma 3, fibroma 4, chondroma 4, melano-sarcoma 2.

Realizing the value and importance of hearty co-operation on the part of the dental surgeon in facilitating prompt diagnosis and

treatment, Field requests all dental practitioners to give this subject watchful attention. He feels that the average person wearing artificial dentures does not report to the dentist as frequently as he should, following the introduction of new prosthetic appliances. At certain periods the changes in the structure, both bone and soft tissue, are very considerable, and that which would be con-

sidered a perfectly adapted denture today may three months hence be a source of continual irritation. Perhaps an equally serious pathological condition to be considered is the chronic hyperemias and untreated pyorrhea alveolaris cases. The latter is an exceedingly common state which is quite often associated with cancer of the maxillary and mandibular regions.

PERISCOPE

Pulpless Deciduous Teeth.—It is frequently very desirable to retain deciduous teeth in the arch, though they are pulpless. After the tooth has been sterilized according to approved methods I would suggest the use of Beck's bismuth paste for root-canal filling. This is best accomplished by using a warm syringe, upon which is mounted a long hypodermic needle. Carry the needle point well up into the canal, and force the soft paste into every part of the canal. This method has proved a real blessing to both patient and operator, and will not complicate matters when resorption takes place.—*Pacific Dental Gazette*.

Pulp Protection.—These days of pulp conservation demand pulp protection under large metallic or synthetic restorations. Zinc oxyphosphate and even zinc chlorid frequently cause irritation and death to the pulp. Also the bacteria-invaded dentin overlying this portion of the pulp is a menace to its life unless an effort is made to give the pulp protection. A paste made of equal parts of hydronaphthol and zinc oxid, with a drop or two of equal parts of oil of cloves and campho-phénique, should be carefully spread over the wall of dentin closest to the pulp, and then sealed in with zinc oxyphosphate.—*Pacific Dental Gazette*.

A Few Precautions in Conduction Anesthesia.—If all requirements of asepsis in connection with the anesthetic solution, the instrumentarium, and the field of operation have been satisfied, no untoward sequelæ of any kind will follow the injection, if it has been made into healthy tissue.

Injection in close proximity to a purulent

center must be avoided in all cases, since virulent bacteria may be carried into deeper layers. In cases of severe inflammation or abscesses, conduction anesthesia must be resorted to. Pain from secondary infection, due to faulty oral hygiene, must not be charged against local anesthesia.—D. P. SNYDER, *Dental Summary*.

Fixed or Removable Bridge Work.—The patient's interest in such work should be one of primary consideration when plans for the restoration are being made. The psychology of the problem will have to be considered, for a patient frequently refuses to accept the thing that is best for him, for no other reason. Many very good pieces of removable work have been condemned because the patient assumed an unfavorable attitude. He had previously settled the matter in his mind by selecting a fixed bridge. We must very carefully consider this attitude of the patient, for it may become morbid, and prove damaging to the practice of removable work.—F. W. FRAHM, *Pacific Dental Gazette*.

Rural Dental Clinic.—Vermont is the first state in the Union to employ a traveling dental clinic for rural district schools. During the twelve months it has been in existence about 7000 fillings have been inserted and 2300 teeth extracted. The work is maintained wholly by private donations, and is under direction of the state board of health, the state board of education, and the Vermont State Dental Association. The dentist selects places on the map most remotely situated as regards dentists. The first treatment is to clean the teeth of the children, and then they are supplied with brushes and

tooth powder. The only drawback to the work at present is that it is very slow. It is simply impossible for one man to visit more than ten or twelve towns a year and do the work thoroughly. Health officials look forward to the time when the movement will be state-wide.—*Oral Hygiene.*

Callahan's Method.—This method to me has several drawbacks as a filling material, which may be classed as follows:

(A) The difficulty met with in introducing the gutta-percha cone and in the pumping motion to form chloro-percha with the rosin solution. The cone bends upon itself, and we do not get the deep penetration which is necessary.

(B) If delays are encountered in introducing the cone, the chloroform evaporates, and results in a sticky mass in which it is impossible to pump the cone. More chloroform solution may be introduced, but there always are some surfaces which do not come in contact with this further addition of chloroform.

(C) The canals should be absolutely dry. Otherwise the rosin is found to form a precipitate which is porous.

(D) If excess of the solution be used to prevent the stickiness of the canals, some of the chloroform is forced through the apex, resulting in the production of pericementitis.—EWING P. BRADY, *Dental Summary.*

Setting Crowns and Bridges.—Any crown or bridge may be firmly set, and still be removed at a later date without destroying either the piece of work or the supporting tooth or root. After the crown (esthetic) has been polished and is ready to set, the pin and plate are coated with one or two coats of chloro-percha, allowing each coat to dry before the next one is applied. Then try the crown in place on the root to make sure it can be seated. It is now cemented to place in the usual manner. Gold contour crowns, such as the shell crown, must have all inside undercuts filled up with gutta-percha, then warmed, and placed over the tooth stump. After trying it in place several times to test its articulation it may be cemented in the usual manner. The Orton and shoulder crown is given a coat or two of the chloro-percha on the walls that will be in contact with the axial and occlusal walls of the tooth stump. They are then tested and cemented to place in the usual manner. When crowns and bridges have thus been prepared they can be removed at a later date by simply heating them to soften the chloro- and gutta-percha and applying traction.—F. W. FRAHM, *Pacific Dental Gazette.*

Iodid of Starch as an Antiseptic for Wounds.—Iodid of starch is recommended as an antiseptic for dressing wounds. It is very active as a bactericide, is stable, is not immediately destroyed by contact with the tissues, and may be left in contact with the wound for many hours, or even for several days, if necessary. Ordinary iodid of starch containing eighteen to twenty per cent. of iodine is too irritant for this purpose. A combination of one part of iodine with ninety parts of starch is sufficiently active, and is free from any irritant action. This is applied direct to the surface in powder form, or as a gelatinous paste by warming it with water. Usually wounds are found to be free from organisms after the third dressing with this. If it is desired to use Carrel's irrigation method, the following solution may be used: Soluble starch 25 gm.; solution of iodine and potassium iodid, 1:100, 50 mls; boiling water to make 1000 mls. This contains 0.5 gm. of iodine in 1 liter, and has an antiseptic power similar to that of Dakin's solution. It is non-irritant, and the adjoining surfaces need not be protected from its action. It has no destructive action on textile fabric, which the hypochlorites rapidly attack.—A. LUMIÈRE, *Pharm. Journal*, per *Amer. Journ. of Pharmacy.*

Dichloramin-T: Points in Use.—Walter E. Lee (*Annals of Surgery*) calls attention to certain points to be observed in handling dichloramin-T or its solutions. All bottles should be of dark amber, glass-stoppered. They should be thoroughly cleaned and dried before any of the materials are put in. If alcohol is used for drying the bottles, it should be allowed to evaporate completely before the bottles are used; no solutions should be returned to the stock bottles from the ward bottles or atomizers at any time; bottles in which the solution has already undergone decomposition should be carefully cleaned with hot water, and dried thoroughly. If, in using the 20 per cent. solution, medicine droppers or glass rods are used to transfer the oil to the wound surfaces, the droppers should be dry if put into the oil bottles. The common practice in some places has been to boil these utensils to sterilize, and then use them while still wet. This results in the gradual accumulation of water in the stock bottles, and a very rapid decomposition of the dichloramin-T. The glass rods or pipets or syringes if left in contact with oil for five or ten minutes are entirely sterilized, and do not need boiling. The method the authors have followed is to pour the required amount

for the wound into a clean dry medicine glass, and to take the oil with the pipet from the second container.—*American Journal of Pharmacy*.

Root-canals and Bridge Work.—Perhaps no problem which confronts the teacher in crown and bridge work today is the source of greater perplexity than the question of devitalization. The dental profession seems to be divided into opposite and mutually hostile groups on this momentous issue. But our opinions are still mere opinions, for it is clear that we do not as yet fully understand the problem; and until we do, we can hardly be certain that we have solved it. Our knowledge of the anatomy of root-canals is very meager, considering the importance which they assuredly have for modern dentistry. We have a limited knowledge of the anatomy of typical teeth, and even less knowledge of variations. We have no morphology of the root-canals, and do not even know how the root-end is closed. It is true that one authority of national reputation, whose prominence is based upon what seems to be the possession of a very accurate technique in the treatment of root-canals, claims that 90 per cent. of them can be properly filled. Another authority of equal prominence claims that 80 per cent. of all root-canals can be filled. But these authorities do not tell us how they arrive at their exact statistics. No scientist can afford to assume infallibility. We do not question the integrity of these authorities, but under the circumstances it seems to me that we have a right to question their soundness of judgment.—FORREST H. ORTON, *Journ. N. D. A.*

Brief Directions for Conduction Anesthesia; Anatomic Landmarks, etc.—The posterior and middle superior dental foramina located upon the zygomatic surface, giving passage to the posterior and middle nerves, innervating soft tissues facially, the bone and pulp of the first, second, third molars, and first and second bicuspid: The needle is inserted in the reflection of the mucous membrane over the molars and advanced on bony surface, without discharging the solution, in an upward and inward direction. When the needle is inserted the full length, a deposit of the solution is made. If the bicuspid are to be anesthetized, 1 cc. of solution is discharged as the needle is withdrawn. Quantity of solution, 2 cc.

Infra-orbital foramen, emitting anterior superior dental nerve, innervating soft tissue facially, bone and pulp of the central, lateral,

and canine: Palpate the lower border of the orbit on the face, press the index finger over infra-orbital foramen; needle inserted in reflection of mucous membrane distally to canine root; advance needle until felt by the finger, pressing the solution in the foramen while injecting. Quantity, 1 cc.

The buccinator nerve supplying the buccal mucosa with sensory fibers sometimes remains sensitive after the mandibular injection. Insert the needle in the buccal region of the third molar, and inject a few drops.—D. P. SNYDER, *Dental Summary*.

Resilient Teeth.—We have received from Australia an interesting brochure describing a new development in the making of artificial teeth. This device, which is originated by Mr. Morse Withycombe, consists of a solid porcelain tooth which is so fitted and retained in a metal socket that it has a limited range of movement in every direction. At the base of the porcelain tooth is baked a layer of metal filings to which the soft rubber, when vulcanized into the socket under pressure, adheres most tenaciously, thereby preventing any possible ingress of secretions between the porcelain tooth and the rubber in the socket. Furthermore, the springy movement of the rubber during mastication makes it impossible for secretions to remain about the margin of the collar. It is claimed that this artificial periodontal membrane permits of some amount of individual tooth movement, and that it acts as a shock absorber and prevents the teeth clacking together. A Sydney bacteriologist examined some of these teeth which had been worn in the mouth. He reported that he received direct from the mouth a plate containing three teeth. The plate was washed in sterile normal saline solution, and the teeth were very carefully broken out of their beds, which were composed of good red rubber. There was not the slightest odor to be detected. Agar slopes were inoculated from the material left in the cavity from which the teeth had been broken and from the surface of the rubber bed. After forty-eight hours all cultures remained sterile. The invention seems to abound in interesting possibilities, and we shall await further reports upon these teeth, and hope to obtain some for our own tests.—*British Dental Journal*.

Notes of a Peculiar Case of Emphysema.—A. F. G., age forty-seven, was under my care with regard to his teeth, and I advised him to have a right central incisor crowned. The tooth was very much worn down by attrition, owing to the fact that he

had for a long while been without back teeth, and had used his incisors as masticators. The tooth was worn down below the gingulum and there showed a ring of secondary dentin in its central portion. A thin plate of enamel in front, which was so thin as to be transparent, had been broken across transversely, and the closeness of the bite forbade the possibility of any restoration by filling. I therefore excised the tooth and removed the pulp, which was somewhat unusually long and the apical end of which was hard, in fact almost cartilaginous. I fitted down a mineral tooth, took an impression in inlay wax, and made a crown with a cast gold backing which fitted the root well, then put a dressing into the root, with the intention of fixing the crown the next day (December 24, 1917).

On his visit to me on that date I removed the dressing, and the root began to bleed rather freely. I dried it out with a wisp of cotton until I had somewhat checked the bleeding, and continued to dry it with fine paper points. When I inserted one I found it passed freely through the apical foramen for a very long distance, and at once concluded that the foramen must be much above the normal size. After I had got the root fairly dry, I commenced to get it thoroughly dry with a hot-air syringe attached to the Dental Manufacturing Co.'s electro-pneumatic apparatus. I had scarcely begun to inject hot air when the whole right side of the patient's face filled out like a blown-up balloon, and he had all the appearance of a person with very severe alveolar abscess, much enlargement showing under the eye, over the whole cheek, and under the jaw.

There was no swelling of the mucous membrane, which remained close to the bone, the swelling being entirely subcutaneous. Another peculiar circumstance was that the swelling was strictly unilateral, and did not extend to the left side of the columella of the nose or the symphysis of the chin.

I at once extracted the root, as I saw no chance of putting on the crown I had made, and found the end of the root much absorbed, and with a very large foramen. The case

went on well, and after two or three days no sign of swelling remained.

How the air can have got up under the skin I cannot see, but there must have been some sort of a sinus from the end of the root to the base of the nose. I described the case to a medical friend of mine, and he told me the symptoms are identical with those found in a prizefighter who gets a broken nose and attempts to blow it, when the air from the lungs is forced through the cheek, etc. As far as I can hear or have read the case is unique, and I shall be very interested to hear if a similar case has come under the notice of any member. As the patient was wearing a plate, it was not difficult to correct the deformity caused by the loss of the tooth. I much regret that I am unable to show you the root, which I had put aside to save, but during a few minutes' absence my maid cleared away the things in my room and the specimen was thrown into the fire and lost. —ALEX. KIRBY.

Note. Privileged as a member of the editorial committee to see the proof of Mr. Kirby's communication, I may perhaps be allowed to add a note. The accident in its essence is not so unique as is suggested. Once when on the staff of the Throat Hospital I was asked to drill into an antrum—one of many such requests—and having done so, as I supposed, I proceeded to wash out the cavity with a weak solution of boric acid. Often a clot of blood, pus, etc., blocks the opening into the nose, and some force is needed to dislodge it. So it seemed in this case, but no fluid came through, and on moving my hand I saw I had blown up the cheek and the loose tissue beneath the lower eyelid. The out-patient sister said she had seen it happen before, and that it slowly disappeared. So it did in my case. What might have followed had I used a caustic fluid I do not like to think, and it has warned me never to do so for the first irrigation. One can never be quite sure he has not perforated the facial surface of the maxilla, or that an opening did not previously exist.—W. H. DOLAMORE. *British Dental Journal*.

OBITUARY

Dr. Wm. Angus Ray.

[SEE FRONTISPIECE.]

DIED, October 15, 1918, at his home in Jacksonville, Fla., in his thirty-fifth year, of influenza-pneumonia, WILLIAM ANGUS RAY, D.D.S.

Dr. Ray was born in Manley, N. C., December 30, 1883, the son of Angus Ray and Flora (Martin Monroe) Ray.

He obtained his early education in the Sanford graded school, from which he was graduated at the age of nineteen years. It was during his school days at Sanford that he received his inspiration to enter his chosen profession. He became a fast friend of the writer, and would watch with intense interest his preceptor in his work. The writer also became interested in him, and it afforded him one of the greatest pleasures of his life to watch this pupil as his life became aflame with the zeal to become a dentist not merely in name or as a mere money-earner, but a real artist. This he did. The friendship here begun and the interest here aroused continued throughout his life.

After graduating from the elementary school he spent two years at the University of North Carolina. In the fall of 1906 he entered the Atlanta Dental College, where he pursued his course to completion in May 1909. Dr. Claude M. Hughes speaks of his dental college career as follows: "During his course Dr. Ray made an average of approximately 98 per cent., and at all times during his stay in college conducted himself in a manner which was most pleasing to every member of the faculty and student body. It would have been impossible for us to have had a student who could have been a better example. His popularity with the class was recognized by his having held offices with the class almost every year of his college course. Ray was a member of the Psi Omega Dental Fraternity, and took very active part in its proceedings."

After his graduation he located in Fayette-

ville, N. C., where he soon became very prominent not only in his profession but in the community as a true high-toned Christian gentleman.

In order to perfect himself for the benefit of his patients he kept abreast of everything in his profession. In 1912 he took a postgraduate course at Northwestern University in nitrous oxid anesthesia. Later he took a course in prosthetic dentistry.

After years of successful general practice he heeded the call of the many who need orthodontia. To perfect himself in this branch he took a postgraduate course at the Forsyth Dental Infirmary, Boston. He then moved to Jacksonville, Fla., where he limited his practice to orthodontia, and was meeting with marked success as a specialist when death claimed him. Dr. Ray was a dentist of the highest type, and a student who studied that he might be approved by both God and man. When his own operations as well as the operations of other men failed, he sought the reason of the failure and the means by which it might be avoided, and he gave to the profession scientific methods of operations which will bless humanity while time lasts.

To have known a man like Dr. Ray, to have enjoyed his friendship, to have felt the warmth of his social nature, to have feasted mentally so often and so bounteously on the satisfying mental pabulum of his production, is to intensify and make more real the belief that "When the earthly house of this tabernacle is dissolved we have a building of God, a house not made with hands, eternal in the heavens."

From boyhood Dr. Ray was a devoted member of the Presbyterian Church.

He was married February 28, 1918, to Miss Belle D. Tillinghast of Fayetteville, N. C., who, with his mother, sisters, and brothers, survives him. His remains were laid to rest in the Buffalo cemetery, Sanford, N. C., October 17, 1918.

F. W. McCracken.

Dr. John Andrews Watling.

DIED, in Washington, D. C., January 17, 1919, of pneumonia, in his eightieth year, JOHN ANDREWS WATLING, D.D.S.

Dr. Watling was born in Woodstock, Ill., June 26, 1839. His father was an Englishman, and came to America when he was nineteen years of age. His mother was a native of New York State. His father settled on a farm near Ypsilanti, Mich., where Dr. Watling spent his boyhood days, and received his early education in the Ypsilanti public schools and the old Ypsilanti Union Seminary. He entered the Ohio College of Dental Surgery at the age of nineteen, and was graduated from that college in 1860. During the time he was a student in college he was engaged in the late Dr. Jonathan Taft's office as assistant.

After graduation he returned to Ypsilanti, and began the practice of dentistry, which he continued to the time of his retirement in 1904. He, with other prominent Michigan dentists, persuaded the regents of the University of Michigan to establish a dental department in connection with that institution, and through the efforts of Dr. Watling, who was at that time secretary of the Michigan Dental Association, and other members of the association, and with Dr. A. T. Metcalf, who was a member of the state legislature, an appropriation was secured at the 1874-75 session of the legislature for the maintenance of a dental department in the university.

The board of regents called Dr. Watling to the chair of professor of clinical and mechanical dentistry, Dr. J. Taft of Cincinnati to the chair of dental medicine and oral surgery, and Dr. W. H. Jackson of Ann Arbor to be demonstrator of mechanical dentistry. The other members of the faculty were selected from the medical faculty of the university.

Dr. Watling retained his professorship until 1903, when he resigned and moved to Washington, D. C., where he lived until his death. Dr. Watling devoted the best years of his life to this service in the university at considerable personal sacrifice, spending one-half of each day at the university for twenty-eight years, with a consistent devotion that was characteristic of everything he under-

took. He was a most able technician both by nature and acquirement. He possessed a strong personality that enabled him to concentrate his energies on his work. He was a master of the art of inserting the malleted gold foil filling, and exacted such a high standard of skill from his students that graduates of his college are to this day known everywhere as masters in this department of operative dentistry. Students who had the good fortune to win his favor are most loyal advocates of the malleted foil filling, in spite of the fact that more recent methods of inlay fillings are at the present time so generally used. As a teacher he did much to advance the practice of operative dentistry, the field in which he excelled as an operator and teacher. His death removes from the profession one of the founders of dental art. He leaves, however, many devoted friends and students to cherish his personal excellent qualities, and to perpetuate the principles of dentistry which he so strongly exemplified in his own life and teachings.

He is survived by his devoted wife, Eunice Wright Watling, whom he married May 5, 1864, his daughter Lucile, and his son John Wright Watling of Detroit.

Dr. Joseph L. Bellefleur.

DIED, December 6, 1918, at the Peter Bent Brigham Hospital, Brookline, Mass., under a surgical operation, in his fifty-eighth year, JOSEPH L. BELLEFLEUR, D.D.S.

Dr. Bellefleur was born in La Prairie, Canada, August 22, 1861. He obtained his early education in the district schools of La Prairie. In 1893 he entered the Boston Dental College, now known as Tufts College Dental School, being graduated from that institution in 1896. Immediately after graduation, Dr. Bellefleur opened an office for the practice of his profession in Salem, Mass., where he continued in practice until the time of his death.

Dr. Bellefleur was a member of the Lynn and Essex County Dental Societies, the Massachusetts Dental Society, the North-eastern Dental Association, and the National Dental Association.

He is survived by his wife and a host of friends who mourn his death.

Dr. Carl S. Briggs.

DIED, December 29, 1918, at his home in South Paris, Me., from influenza-pneumonia, CARL S. BRIGGS, D.D.S.

Dr. Briggs was born in South Paris, Me., March 1, 1886, the son of Mrs. Cora S. and the late George A. Briggs. Dr. Briggs obtained his early education in the schools of South Paris, being graduated from the high school. Having displayed considerable musical talent in his boyhood days, he studied

the violin under the famous Scheda. For some years thereafter, he taught the violin, and played in the orchestra of South Paris. He later became interested in dentistry, and entered Tufts College Dental School, from which institution he was graduated in 1913. Immediately after graduation he established himself in practice in South Paris, where he remained until the time of his death.

Dr. Briggs was married June 16, 1915, to Miss Ida Dean of South Paris, who, with his mother and a sister, survives him.

ARMY AND NAVY DENTAL NEWS

Naval Dental Officers Temporarily Promoted.

THE comptroller holds that a dental corps officer given a temporary promotion in rank by virtue of the act of July 1, 1918, is entitled to the pay and allowances thereof from the date stated in the temporary appointment or from the date of the approval of the act. The case presented was that of Lieutenant-commander H. W. Blaisdell, passed assistant dental surgeon, who was given a temporary advancement in rank by orders of September 8th. The comptroller says:

"The act of August 29, 1916, provided three ranks for dental surgeons, the same being based upon length of service, viz, those with less than five years' service the rank of lieutenant (junior grade), those with five years' service but less than twenty years' service the rank of lieutenant, and those with more than twenty years' service the rank of lieutenant-commander. The act of July 1, 1918, which repealed all acts inconsistent therewith, provides three grades for dental officers of the navy, viz, assistant dental surgeons, passed assistant dental surgeons, and dental surgeons, and also changed the requirements relative to the rank of said officers. Instead of basing the rank of dental officers upon length of service it provides that they 'shall be eligible for advancement in grade and rank in the same manner and under the same conditions as officers of the naval medical corps with or next after whom they take precedence, and shall receive the same pay and allow-

ances as officers of corresponding rank and length of service in the naval medical corps up to and including the rank of lieutenant-commander.'

"It is apparent that this act assimilates the rank (within the limitation stated), also the pay and allowances, of all officers in the dental corps on July 1, 1918, to the rank, pay, and allowances of officers of the naval medical corps of corresponding rank and length of service.

"Unless explicitly so declared in the act or unless such intention appears by necessary implication from the nature and wording of the act, statutes should not be construed to be retroactively effective as to pay and allowances. In this case the date of advancement in rank is prior to the date of the statute authorizing such advancement, and unless the statute clearly so provides the officer is not entitled to the pay and allowances of the advanced rank prior to the date of the statute.

"As stated above, the prior statute based the rank of such officers upon length of service, but this statute assimilates their rank to the rank of 'officers of the naval medical corps with or next after whom they take precedence.' The officer of the naval medical corps with or next after whom Lieutenant-commander Blaisdell took precedence—that is, his 'running mate'—attained the rank of lieutenant-commander on February 1, 1918. The apparent purpose of the statute is to confer on dental surgeons the same right to advancement in rank (within certain limi-

tations) as is enjoyed by officers of the medical corps, by giving each dental officer a 'running mate' (the one with or next after whom he takes precedence), and when the running mate is advanced in rank the dental officer is entitled to the same advancement. In this case Lieutenant-commander Blaisdell's running mate was advanced in rank from February 1, 1918, and in order to give effect to the statute which conferred upon him rank 'in the same manner and under the same conditions' as his running mate, Lieutenant-commander Blaisdell was advanced and placed on the list of lieutenant-commanders as taking rank and precedence from said date. To take rank with his running mate he must take rank at the same time—that is, on the same date. The letter of the Secretary of the Navy is not a commission, but in effect it is notice to the officer that, in accordance with the terms of the statute, he would take rank and precedence on the list of lieutenant-commanders from and including February 1, 1918. The officer's right to advanced pay and allowances prior to July 1, 1918, depends upon the terms of the statute and not upon the secretary's action.

"The advancement in rank and precedence authorized by the statute determines the officer's relative position on the list, but does not require, or imply, that it shall carry retroactively advanced pay and allowances.

"The concluding clause of the statute provides that the officer 'shall receive the same pay and allowances as officers of corresponding rank and length of service in the naval medical corps.'

"There is nothing in the wording of this clause, or in the context or other related statutes, which negatives the ordinary rule of construction that the authorization to receive pay and allowances thereunder becomes operative from and after the approval of the act."—*Army and Navy Register*.

Assignments.

Army Dental Corps.

Week ending March 8th.

Maj. Guy P. Bannister report to Washington for duty in office of attending surgeon.

Maj. Ben H. Sherrard to Washington, and report to director of purchase, storage, and traffic for duty.

Week ending March 15th.

Maj. Rumsey F. Rowdybush to Walter Reed General Hospital, D. C., for duty.

Promotions.

Army Dental Corps.

Announced March 15th:

To be CAPTAINS (from July 13, 1918):
1st Lieuts. Samuel J. Rhode, Leroy P. Hartley, Frederick C. Daniels, Nathan C. Pickles, Robert L. Lowry, Oliver J. Christiansen, Timothy Harden, Lawrence K. Anderson, Timothy F. Leary, Wm. C. Webb, Jr., Edward C. Alley, Clinton R. Boone, David I. Edwards, Orville A. Grove, Roy M. Kiesner, Edward A. Thorne, Lynn H. Tingay, Claude R. Holister, and Marhl H. Welch.

To be CAPTAINS (from October 4, 1918):
1st Lieuts. Walter D. Vail, Richard K. Thompson, Leslie S. Harlan, Neil J. McCollum, Clement J. Gaynor, Walter A. Rose, Melvin R. Eiche, George Krakow, Eugene A. Smith, Jerome S. Fritsche, Clarence J. Wright, Milton A. Price, Wm. H. Hoblitzell, Francis M. Tench, Alvin E. Anthony, Wm. J. R. Akeroyd, Fletcher D. Rhodes, Wm. B. Caldwell, Lewis W. Maly, Arthur T. Burchill, Glover Johns, Frederick W. Herms, Harold J. Parker, Leslie D. Baskin, Curtis W. Hallam, James E. Dean, Henry L. Hogan, John C. Campbell, Leland S. Wilson, Benjamin H. Dean, Dell S. Gray, Wm. B. Stewart, Julius L. Bischof, Charles H. Brammell, John A. Rowe, Wm. T. Williams, Hooker O. Lindsey, Alvin D. Dannheiser, James R. Conner, Robert L. Strickland, Roy R. Newman, Boyd L. Smith, Avery G. Holmes, George R. Kennebeck, Alexander M. Smith, Jr., Horace R. Finley, Cecil R. Hays, Roy C. Starr, Harold S. Embree, Charles L. Andrews, Joseph L. Boyd, Joseph L. Rahm, Clarence R. Jacobson, Norman M. Mackenzie, Richard F. Thompson, Henry H. Collins, and Adrian C. Ragan.

To be CAPTAIN (from October 8, 1918):
1st Lieut. Byram S. Purviance.

To be CAPTAINS (from November 24, 1918):
1st Lieuts. Horace S. Villars, Donald G. Russell, Allen D. Lazenby, Patrick F. McGuire, James W. McClaran, Louis F. Boyd, Tom S. Mebane, Edmund B. Spaeth, Philip L. Coulter, James B. Montgomery, Percy E. Duggins, Brown S. McClintie, Henry K. B. Hufford, Joseph G. Fernbach, Howard H. Dignan, Charles W. Sale, Robert H. Lowry, Jr., Hertel P. Makel, Ward S. Wells, Seymour C. Schwartz, Purgh S. Burnet, Karl F. Kesmodel, Ross Golden, Curtis D. Pillsbury, Nelson A. Myll, John R. De Velling, Roy L. Scott, Wm. W. Southard, George H. Dorsey, Laurent L. La Roche, Henry C. Dooling, Frank S. Matlack, Cleon J. Gentz-

kow, James P. Crawford, Robert A. Hale, Allen R. Howard, Benjamin B. Rowley, Henry C. Bradford, Harry H. Towler, Oral B. Boli-baugh, Joseph R. Jones, Harold E. Clark, Roland A. Davison, Charles R. Snyder, Haskett L. Conner, Edward B. Macon, Percy J. Carroll, Virginius Minervini, James V. Falisi, Wm. D. Petit, Glenn H. Reams, Jay De P. Mingos, Allan W. Dawson, John W. McKeever, Ottis L. Graham, Edwin H. Roberts, Arthur M. Bacon, John J. Moore, Anthony J. Vadalo, Maurice S. Weaver, John M. Stanley, Arthur H. Nylon, Myron P. Rudolph, Noble DuB. McCormick, Charles E. Sima, Bascom H. Palmer, Harold D. Rogers, John R. Hall, Arthur R. Gaines, Wm. L. Starnes, Wm. A. Boyle, Manton L. Shelby, Paul H. Streit, John E. Robinson, Lewis E. J. Browne, Ernest K. Stratton, James A. Orbison, Paul M. N. Kyle, Wm. C. Whitmore, Albert B. Pavy, Francis E. Evans, Charles E. Brenn, Francis T. Duffy, Leonard W. Weaver, Louis Felger, Leo S. Trask, Raymond A. Tomassene, Lowd W. Ballantyne, Otto R. Brown, Charles E. Yoho, Cornelius A. Denehy, Joseph P. Madigan, Robert K. Simpson, Patrick S. Madigan, Frederick B. Little, Chester A. Stayton, Herbert W. Rogers, John R. Evers, Ralph E. Curti, Daniel C. Hankey, Frederick A. Blesse, Charles C. Dickey, George B. Fletcher, Walter H. Mytinger, John J. Carden, Henry E. Fraser, John R. Whisenant, Harold H. Golding, Harry P. Shugerman, Wm. C. Pollock, Wm. W. McCaw, Edward H. Tonolla, Earle D. Quinnell, Harold O. Brown, Douglas H. Mebane, Paul B. Johnson, Irving K. Lovett, Montreville A. St. Peter, Frank McA. Moose, Percy K. Telford, Benjamin F. Pence, Wayne R. Beardsley, Warren Stirling, Don G. Hildrup, Richard S. Magee, Wm. A. Smith, Frank W. Pinger, Ivy A. Pelzman, Edward S. Murphy, Richard E. Werlich, Herbert R. Stolz, Louis de K. Bel-den, Andrew W. Smith, Willard S. Howard,

Philip P. Green, Wm. H. Barrow, Gordon F. Willey, Frank A. Plum, Charles R. Irving, Wm. W. Jones, Charles C. Hawke, Noland M. Canter, Pierre N. Charbonnet, James C. Kimbrough, Meredith R. Johnston, Merrill K. Lindsay, Wm. D. Middleton, Leon H. Cornwall, Read B. Harding, James W. Duckworth, Bradford Massey, Edgar H. Howell, George W. Snyder, Paul S. Wagner, John A. P. Millet, Joseph D. Foley, Lewis A. Newfield, Thomas M. Leahy, Louis A. La Garde, Jr., and Edward L. Moore.

Navy Dental Corps.

Announced March 8th:

To be PASSED ASSISTANT DENTAL SURGEONS: E. W. Lacy, H. D. Johnson, H. W. Blaisdell, P. G. White, H. T. Meyers, L. A. Willard, G. H. Reed, J. R. Barber, J. V. McAlpin, M. W. Mangold, and T. L. Sampsell.

To be ASSISTANT DENTAL SURGEONS: A. G. Lyle, A. J. Zuehlke, G. M. Frazier, F. C. Vossbeck, F. S. Tichy, R. A. Ferguson, A. W. Chandler, Albert Knox, E. K. Patton, I. G. Kohlmeier, R. C. Green, J. C. Lough, G. C. Fowler, D. L. Chamberlain, W. R. Taylor, and J. E. Herlihy.

To be ASSISTANT DENTAL SURGEONS with rank of LIEUTENANT (JUNIOR GRADE): DeW. C. Emerson, L. C. Montgomery, R. S. Maxwell, R. S. Davis, J. I. Root, H. A. Daniels, J. A. Tartre, K. K. Weaver, C. C. Tinsley, H. F. Delmore, P. W. Yeisley, W. T. Davidson, L. E. McGourty, H. A. Sturtevant, H. J. Lehman, A. T. Fellows, F. P. VanValin, E. A. Ryland, I. G. Brennan, P. R. Smith, H. M. Seldin, E. A. Jasper, A. E. Rush, L. V. Felke, H. F. Buchanan, L. G. Pollock, R. C. Sheridan, C. V. Rault, J. J. Hass, H. C. Wichan, H. C. Striffler, C. R. Wells, R. W. Faulkner, Walter Rehrauer, L. C. Austin, R. M. Askin, W. S. Thompson, J. P. Copp, C. L. Norris, W. F. Hawthorn, H. L. Kalen, and P. H. MacInnis.

SPECIAL NOTICE.

THE "JOHN R. CALLAHAN" MEMORIAL.

At the December 1918 meeting of the Ohio State Dental Society, a resolution was adopted to perpetuate the memory of the late JOHN R. CALLAHAN in recognition of his contributions to the science and art of dentistry and his unselfish devotion to its advancement throughout the many years of his professional life.

The Committee to which this Memorial was referred has decided on the following as the most appropriate, and worthy of the approval of the profession.

First. A BRONZE MEMORIAL—to be placed in the Cincinnati General Hospital grounds.

Second. A CALLAHAN MEMORIAL RESEARCH FUND—the income from it to be awarded from time to time to the person making the best contribution to the Science and Art of Root-canal Problems. The Fund and award to be under the direction of a committee perpetuated by the Ohio State Dental Society. The prize to be known as "The John R. Callahan award."

The sum necessary, in the minds of the Committee, to carry out the Memorial in its two phases should approximate \$8000, an amount that should speedily be raised in these times when the spirit of giving is universal.

Subscriptions to this fund by individuals or societies will be duly credited, and should be forwarded to the Secretary-Treasurer of the Fund.

COMMITTEE.

T. IRVING WAY, *Chairman*, 52 Groton Bldg., Cincinnati.

HENRY E. GERMANN, *Sec'y-Treas.*, 719 Gwynne Bldg., Cincinnati.

L. L. BARBER, Toledo.

WESTON A. PRICE, Cleveland.

L. E. CUSTER, Dayton.

EDWARD C. MILLS, Columbus.

SOCIETY NOTES AND ANNOUNCEMENTS

NOTICES should reach the Office of the DENTAL COSMOS *not later than the 11th or 12th of the month preceding that of publication.*

Coming Dental Society Meetings.

With the National.

NATIONAL DENTAL ASSOCIATION. New Orleans. October 20th to 24th.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS. New Orleans. October 20th to 24th.

NATIONAL ASSOCIATION OF DENTAL FACULTIES. New Orleans. October 20th to 24th.

ASSOCIATION OF MILITARY SURGEONS. New Orleans. October 20th to 24th.

DELTA SIGMA DELTA FRATERNITY. New Orleans. October 20th.

PSI OMEGA FRATERNITY, GRAND CHAPTER AND NATIONAL ALUMNI CHAPTER. New Orleans. October 20th to 24th.

XI PSI PHI FRATERNITY. New Orleans. October 20th to 24th.

State Meetings.

APRIL.

ALABAMA STATE DENTAL SOCIETY. Birmingham. April 7th to 11th.

CONNECTICUT STATE DENTAL ASSOCIATION. Hartford. April 15th and 16th.

KANSAS STATE DENTAL SOCIETY. Topeka. April 14th to 16th.

MICHIGAN STATE DENTAL SOCIETY. Detroit. April 7th to 12th.

MISSOURI STATE DENTAL ASSOCIATION. St. Louis. April 14th to 16th.

MISSISSIPPI STATE DENTAL SOCIETY. Clarksdale. April 15th to 17th.

ONTARIO DENTAL SOCIETY. Toronto. April 28th to May 1st.

PENNSYLVANIA STATE DENTAL SOCIETY. Pittsburgh. April 29th and 30th and May 1st.

TEXAS STATE DENTAL SOCIETY. Waco. April 22d to 25th.

WEST VIRGINIA STATE DENTAL SOCIETY. Wheeling. April 9th to 11th.

MAY.

ARKANSAS STATE DENTAL SOCIETY. Pine Bluff. May 19th.

EASTERN ASSOCIATION OF GRADUATES OF THE ANGLE SCHOOL OF ORTHODONTIA. New York City. May 5th and 6th.

ILLINOIS STATE DENTAL ASSOCIATION. Peoria. May 13th to 16th.

INDIANA STATE DENTAL SOCIETY. Indianapolis. May 20th to 23d.

IOWA STATE DENTAL SOCIETY. Des Moines. May 6th to 8th.

MASSACHUSETTS STATE DENTAL SOCIETY. Boston. May 7th to 9th.

NEBRASKA STATE DENTAL SOCIETY. Omaha. May 20th to 22d.

SOUTH DAKOTA STATE DENTAL SOCIETY. Mitchell. May 1st to 3d.

JUNE.

CALIFORNIA STATE DENTAL ASSOCIATION. San Francisco. June 23d to 28th.

DENTAL SOCIETY OF THE STATE OF NEW YORK. Syracuse. June 12th to 14th.

FLORIDA STATE DENTAL SOCIETY. Tampa. June 18th to 20th.

GEORGIA STATE DENTAL SOCIETY. Savannah. June 11th to 13th.

KENTUCKY STATE DENTAL ASSOCIATION. Louisville. June 9th to 12th.

NEW HAMPSHIRE STATE DENTAL SOCIETY. Manchester. June 18th to 20th.

NORTHERN OHIO DENTAL ASSOCIATION. Cleveland. June 2d to 4th.

NORTH CAROLINA DENTAL SOCIETY. Asheville. June 25th to 27th.

SOUTH CAROLINA DENTAL ASSOCIATION. Columbus. June 19th to 21st.

Examiners' Meetings.

MAINE BOARD OF DENTAL EXAMINERS. Augusta. July 1st.

MISSISSIPPI BOARD OF EXAMINERS. Jackson. June 17th.

NORTH CAROLINA BOARD OF EXAMINERS. Asheville. June 23d.

SOUTH CAROLINA BOARD OF EXAMINERS. Bamberg. June 16th.

SOUTH DAKOTA BOARD OF EXAMINERS. Sioux Falls. June 25th to 27th.

VERMONT BOARD OF EXAMINERS. Montpelier. June 30th and July 1st and 2d.

VIRGINIA BOARD OF EXAMINERS. Richmond. June 24th.

Psi Omega Fraternity.

NEW YORK ALUMNI CHAPTER.

THE twenty-seventh annual banquet of the Chapter will be held at the Hotel Commodore, 42d st. and Lexington ave., New York City, on Saturday, May 3d, 1919, at 6.30 P.M. Every Psi Omega in this vicinity is cordially and fraternally invited to be present to help welcome those of our brothers who have been in the service. Send name and address to

JOHN L. PETERS, *Treasurer*,
133 W. 72d st., New York City.

Ontario Dental Society.

THE Ontario Dental Society will hold its annual meeting in Toronto, Ont., Monday, Tuesday, Wednesday, and Thursday, April 28, 29, 30, and May 1, 1919.

J. E. RHIND, *President*,
Toronto, Ont.
J. A. BOTHWELL, *Sec'y*,
604 Spadina ave., Toronto.

Missouri State Dental Association.

THE annual meeting will be held in the new Hotel Statler, St. Louis, Mo., April 14, 15, and 16, 1919.

A very elaborate program is in preparation. The first two days of the meeting will be devoted to clinical instruction in the most advanced phases of modern dental practice, by competent and experienced teachers. Specials are—Dr. Justin D. Tower, Memphis, "Periodontia." Dr. George Thompson, Chicago, "Dental Ceramics and Removable Bridges." Dr. Boyd Bogle, Nashville, "Radio-dontia and Oral Surgery." Dr. Gillett Hayden, Columbus, "Preventive Dentistry." Dr. S. L. Silverman, Atlanta, "Conductive Anes-

thesia and Root Resection." Dr. H. A. Maves, Minneapolis, "Crown and Inlay Technique." Dr. Philip R. Thomas, Minneapolis, "Pedodontia."

A general clinic session of individual and group clinics will be given the afternoon of the 16th. Members of the National Dental Association are invited to attend the meeting and contribute to the clinical program.

H. F. D'OENCH, *President*,
1703 S. Grand ave., St. Louis, Mo.
J. F. WALLACE, *Sec'y*,
Canton, Mo.

Michigan State Dental Society.

THE sixty-third annual meeting will be held at Hotel Statler, Detroit, April 7 to 12, 1919.

To meet the demand for dental meetings that *teach*, another postgraduate course, greatly improved and added to, will be put on by the Detroit Dental Clinic Club. All-Michigan talent will also make up the general program.

CHALMERS J. LYONS, *President*,
CLARE G. BATES, *Sec'y*,
Durand, Mich.

Mississippi Dental Association.

THE annual session of the Mississippi Dental Association will be held in Clarksdale, Miss., April 15 to 17, 1919.

Dr. W. C. Dennis of Jackson has been elected president of the association, to serve the unexpired term of Dr. Varnado, who resigned on account of moving from the state. Dr. Dennis was vice-president before being elected president.

W. F. BEAVERS, *Sec'y*,
Meridian, Miss.

Connecticut State Dental Association.

THE fifty-fifth annual meeting of the Connecticut State Dental Association will be held in the Chamber of Commerce Assembly Hall, 252 Asylum st., Hartford, Conn., on Tuesday and Wednesday, April 15 and 16, 1919. The program is replete with interesting features, and all members of the National Dental Association are cordially invited.

Further information will be supplied by
MORTON J. LOEB, *Sec'y*,
35 Elm st., New Haven, Conn.

Texas State Dental Society.

CHANGE OF DATE OF MEETING.

THE thirty-ninth annual convention of the Texas State Dental Society will be held at Waco, Texas, April 22 to 25, 1919.

Several men of national prominence will conduct the postgraduate feature of the meeting, which will supplement the program of papers and clinics by members of the society.

J. G. FIFE, *Sec'y*,

736 Wilson Bldg., Dallas, Texas.

Pennsylvania State Dental Society.

THE fifty-first annual meeting of the Pennsylvania State Dental Society will be held at the William Penn Hotel, Pittsburgh, Pa., Tuesday, Wednesday, and Thursday, April 29, 30, and May 1, 1919. An interesting and instructive program has been prepared. All ethical practitioners are cordially invited to be present.

J. F. BIDDLE, *Sec'y*,

517 Arch st., Pittsburgh, Pa.

Iowa State Dental Society.

THE annual meeting of the Iowa State Dental Society will be held in Des Moines, Iowa, May 6, 7, and 8, 1919. An interesting program has been arranged. Men from out of the state holding National cards are cordially invited to attend all sessions.

For further information address

E. R. SWANK, *Sec'y*,

C. N. B. Bldg., Des Moines, Iowa.

Philadelphia Dental College.

ALUMNI SOCIETY.

THE annual meeting of the Alumni Society of the Philadelphia Dental College (Temple University) will be held on Wednesday, April 16, 1919, in the College building, at 18th and Buttonwood sts. All members should be present.

FRANKLIN S. FLUCK.

CLASS OF 1914.

THE reunion of the class of 1914 of the Philadelphia Dental College will be held on Wednesday, April 16, 1919, in the College building, at 18th and Buttonwood sts.

All members who expect to attend the reunion will kindly communicate with

LEON A. HALPERN,

2438 N. 33d st., Philadelphia, Pa.

Connecticut Dental Hygienists' Association.

THE fifth annual meeting will be held at Hotel Stratfield, Bridgeport, Conn., on Friday and Saturday, May 23 and 24, 1919. All interested in the work of the dental hygienist are most welcome.

(MISS) RUBY STEELE, *Sec'y*,

170 Main st., Bristol, Conn.

Illinois State Dental Society.

THE fifty-fifth annual meeting of the Illinois State Dental Society will be held in Peoria, Ill., May 13, 14, 15, and 16, 1919.

J. P. LUTHRINGER, *Sec'y*,

Peoria, Ill.

South Dakota State Dental Society.

THE South Dakota State Dental Society will hold its thirty-seventh annual meeting at Mitchell, S. D., May 1, 2, and 3, 1919.

E. W. ELMEN, *Sec'y*, Sioux Falls, S. D.

Northern Ohio Dental Association.

THE Northern Ohio Dental Association meeting will be held in Cleveland, Ohio, Monday, Tuesday, and Wednesday, June 2, 3, and 4, 1919, at the Hotel Statler.

GEO. B. SMITH, *Sec'y*, Fremont, Ohio.

South Carolina Dental Association.

THE annual meeting of the South Carolina State Dental Association will be held on the campus of South Carolina University, Columbia, S. C., June 19 to 21, 1919.

G. A. MILNER, *President*,

ERNEST C. DYE, *Sec'y*,

Greenville, S. C.

California State Dental Association.

THE 1919 session of the California State Dental Association will be held at the University of California, San Francisco, Calif., June 23, 24, 25, 26, 27, and 28, 1919. The meeting will be conducted on the postgraduate plan. Members of other associations are invited providing their 1919 dues are paid, and that they shall pay the special fee for the course in which they may be interested. For further information address

J. E. GURLEY, *Sec'y*,

350 Post st., San Francisco, Calif.

Dental Society of the State of New York.

THE Dental Society of the State of New York will hold its fifty-first annual meeting June 12, 13, and 14, 1919, at the Hotel Onondaga, Syracuse, N. Y. All ethical dentists residents of New York and those residing in adjoining states are cordially invited to be present at the sessions of the society.

Dr. A. C. Bickelhaupt, City Bank Bldg., Syracuse, N. Y., is chairman of the Exhibits Committee.

A. P. BURKHART, *Sec'y*,
52 Genesee st., Auburn, N. Y.

North Carolina Dental Society.

THE North Carolina Dental Society will hold its next annual session June 25, 26, and 27, 1919, at Asheville, N. C. Headquarters Battery Park Hotel.

W. T. MARTIN, *Sec'y*,
Benson, N. C.

Kentucky State Dental Association.

JUBILEE MEETING.

THE fiftieth anniversary—"Jubilee meeting"—of the Kentucky State Dental Association will be held in Louisville, Ky., June 9, 10, 11, and 12, 1919.

A postgraduate course of unusual interest has been planned. Address all correspondence to

W. M. RANDALL, *Sec'y*,
Louisville, Ky.

American Institute of Dental Teachers.

THE annual meeting of the American Institute of Dental Teachers was held at the Piedmont Hotel, Atlanta, Ga., January 28 to 30, 1919.

The following officers were elected for the ensuing year: Dr. R. W. Bunting, Ann Arbor, Mich., president; Dr. Arthur D. Black, Chicago, Ill., vice-president; Dr. Abram Hoffman, Buffalo, N. Y., secretary-treasurer. Executive Board—Dr. G. S. Millberry, San Francisco, Dr. A. H. Hipple, Omaha, Dr. A. E. Webster, Toronto.

The next regular meeting will be held at Detroit, Mich.

ABRAM HOFFMAN, *Sec'y*,
381 Linwood ave., Buffalo, N. Y.

Northwestern University Dental School.

ANNUAL HOMECOMING CLINIC.

THE annual Homecoming Clinic of the Northwestern University Dental School will be held June 16 and 17, 1919. A splendid program has been arranged for each day, covering subjects of vital interest in the practice of modern dentistry.

For information please communicate with the secretary of the Alumni Association.

M. M. PRINTZ,
25 E. Washington st., Chicago, Ill.

North Carolina Board of Examiners.

THE next meeting of the North Carolina State Board of Dental Examiners will be held at Asheville, N. C., beginning promptly at 9 o'clock on Monday morning, June 23, 1919.

For further information and application blank address

F. L. HUNT, *Sec'y*,
Asheville, N. C.

Virginia Board of Examiners.

THE next meeting of the Virginia State Board of Dental Examiners will be held in Richmond, Va., beginning at 9 o'clock on Tuesday morning, June 24, 1919.

For further information and application blanks address

J. LEWIS WALKER, *Sec'y*,
505 Taylor Bldg., Norfolk, Va.

Vermont Board of Examiners.

THE next meeting of the Vermont Board of Dental Examiners, for the examination of candidates to practice in Vermont, will be held at the State-house, Montpelier, commencing at 2 P.M. on June 30, 1919, and continuing for three days.

To be eligible for examinations a candidate must be (1) twenty-one years of age, (2) a graduate of a high school of the first class, and (3) a graduate of a reputable dental college.

Applications must be in the hands of the secretary not later than June 21st.

For further information apply to

HARRY F. HAMILTON, *Sec'y*,
Newport, Vt.

South Carolina Board of Examiners.

THE next meeting of the South Carolina State Board of Dental Examiners will be held at Bamberg, S. C., commencing promptly at 9 o'clock, Monday morning, June 16, 1919. All applications should be in the hands of the secretary by June 6th.

R. L. SPENCER, *Sec'y*,
Bennettsville, S. C.

Mississippi Board of Examiners.

THE next meeting of the Mississippi State Board of Dental Examiners will be held in the Capitol Building, Jackson, Miss., on the third Tuesday in June. Examinations begin at 8.30 A.M. daily until completion. Fee \$10. Diploma from recognized school and certificate of moral character required. Application blanks and further information can be obtained from

B. J. MARSHALL, *Sec'y*,
6-7 Turner-Cox Bldg., Marks, Miss.

South Dakota Board of Examiners.

THE next meeting of the South Dakota State Board of Dental Examiners will be held in Sioux Falls, S. D., June 25, 26, and 27, 1919, beginning promptly at 9 A.M. June 25th.

All applications must be in the hands of the secretary by June 20th. Fee for examination \$25.00. No reciprocity or interchange. Address

L. S. SPENCER, *Sec'y*,
Watertown, S. D.

Maine Board of Examiners.

THE Maine Board of Dental Examiners will meet at the State-house, Augusta, for its next regular examination, beginning July 1, at 8.30 A.M.

All applications and fee of \$20 must be in the hands of the secretary by June 21st.

The examination for dental hygienists will be given at the same time; fee \$10.

WILL S. PAYSON, *Sec'y*,
Castine, Me.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING JANUARY 1919.

January 7.

- No. 1,290,250, to ARTHUR A. LAWRY. Apparatus for casting gold inlays.
- No. 1,290,399, to MURRELL A. STEVENS. Dental implement.
- No. 1,290,448, to GEO. H. WHITELY, JR. Means for molding artificial teeth.
- No. 1,290,501, to SOLOMON J. BRANDEIS. Cutting forceps.
- No. 1,290,568, to WILLIAM A. JOHNSTON. Dental equipment stand.

January 14.

- No. 1,291,163, to THOMAS W. ROSS. Bubble fountain for dental cuspidors.
- No. 1,291,349, to FRANK O. ACKERS. Tooth-brush holder.
- No. 124,091, to FOX DENTAL SUPPLY CO. Trade-mark for dental metal.
- No. 124,171, to VIGGO VALDEMAR J. ANDRESEN. Trade-mark for mouthwashes and dental medicament.

January 21.

- No. 1,291,826, to JOHN L. GARRETSON. Dental film drying apparatus.
- No. 1,291,919, to MATHEW W. KERR. Dental articulator.
- No. 1,292,055, to WALTER S. PORTER. Dental cabinet and laboratory.
- No. 1,292,133, to ELMER B. STOUGHTON. Dam holder.
- No. 1,292,252, to AUGUSTUS CARRIER. Holder for dental broaches or the like.

January 28.

- No. 1,292,632, to PETER J. L. NEMMERS. Bur holder for dental tools.
- No. 1,292,702, to JOHN E. CANNING. Tooth regulator.
- No. 1,292,885, to FRANK C. RODGERS. Tooth-straightening appliance.
- No. 1,292,952, to LEO E. EVSLIN. Artificial tooth.



DR. JAMES G. TEMPLETON.

THE DENTAL COSMOS

VOL. LXI.

MAY 1919.

No. 5

ORIGINAL COMMUNICATIONS

Bone Absorption Around the Roots of Teeth.

By EUGENE S. TALBOT, M.D., D.D.S., Chicago, Ill.

NO subject has received so much attention in the past few years by dentists as that of bone absorption around the roots of the teeth. This includes "interstitial gingivitis," "pyorrhea alveolaris," and so-called "apical abscesses."

Even at the present day, after all that has been published, there is no subject that is so little understood. I base this statement on the lectures in our dental schools, upon the literature of the subject, remarks made in dental societies, and reports from radiographers.

The reason for this is the fact that these remarks, discussions, and papers are all based upon X-ray pictures, which do not show the pathology, and therefore the true condition is lost sight of. While the X-ray does in a general way outline defects about the roots of the teeth when abnormal conditions exist, the radiographs do not give the operator the picture so necessary for his guidance in the treatment of interstitial gingivitis, pyorrhea alveolaris, or apical alveolar changes.

There are a number of stages in the pathologic evolution from the normal healthy tissues to a fully formed abscess in which the X-ray does not and cannot by the present method discriminate.

To treat successfully diseased teeth and the alveolar tissues, we must in some way be able to distinguish the finer changes which occur in the evolution of a fully developed abscess. Each stage requires different treatment, and a knowledge of each stage is necessary in deciding whether a tooth can be saved or must be removed.

We know now that many secondary diseases of the body are due to diseases of the teeth and alveolar process. A large percentage of diseases of the apical dental tissues have nothing to do with systemic disease. The microscope, therefore, is the only means by which these finer pathologic changes can be recognized. Before we can comprehend these changes with the microscope, however, we must have a clear conception as to the causes of bone absorption about the roots of the teeth. The causes of the con-

ditions which we as a profession are called upon to treat may be divided into irritations and infections.

Most of the pathology of the alveolar process which comes under our notice for treatment is due to irritation. It is only when ulceration (pyorrhea) occurs at the gum margin, and alveolar and other abscesses form in the deeper tissues about the teeth after bone absorption has occurred, that infection takes place.

For the past twelve years I have been doing research work on animals such as dogs, cats, pigs, lambs, and monkeys, by performing upon them under aseptic conditions all the operations that are performed upon patients in the dental office. Some of this work was done in the laboratories at Rush Medical College, some in my office, and some at my home. These operations consisted of wedging the teeth apart for the purpose of obtaining space, drilling holes through the roots of the teeth at different points, making applications of arsenic for the purpose of destroying the pulp, removing the pulp tissue and filling the roots with oxychlorid of zinc, passing gutta-percha cones through the roots into the tissues, and making applications of carbolic acid, creasote, oil of cloves, oil of wintergreen, oil of cassia, oil of eucalyptus, glycothymoline, distilled water, and air-pressure for root-dressing, always allowing the drug to pass through the root into the apical tissues.

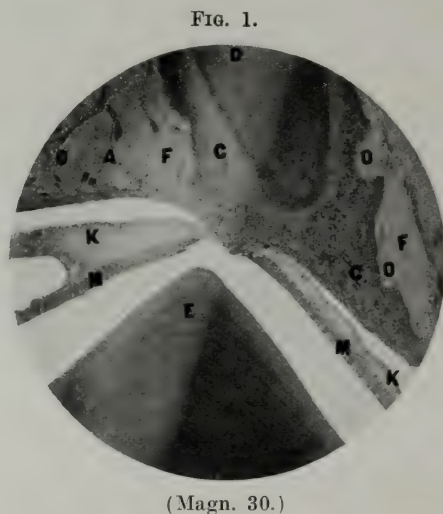
Having a large amount of material on hand for these experiments, only young, healthy dogs were used. They were killed two, four, six, and eight weeks after the operation. There being no disease about the jaws and teeth, the results of the operations were easily recognized. Thousands of sections were obtained; therefore, these results are not based upon one animal, tooth, or slide.

Taking the pictures in the order in which the operations are performed in the mouths of our patients and conducted upon animals (dogs in this series of experiments), the results here demonstrated were obtained. In making these pictures the author labored under two difficulties. To obtain details a high

magnification is required and a large area is lost. On the other hand, to produce a large area, details are lost. In this series of pictures large areas are necessary. Those, however, who are accustomed to the microscope can readily detect osteoclast absorption. Of the three classes of bone absorption, osteoclast absorption is here demonstrated in each picture. Every student is familiar with this form of bone absorption, hence there will be no question as to the pathology. Please note in all of these pictures that no matter what the cause may be, bone absorption always takes place first, leaving the fibrous tissue (the trabeculae) in position.

NORMAL BONE ABSORPTION.

Fig. 1 shows an area between the crown of a permanent premolar of a dog



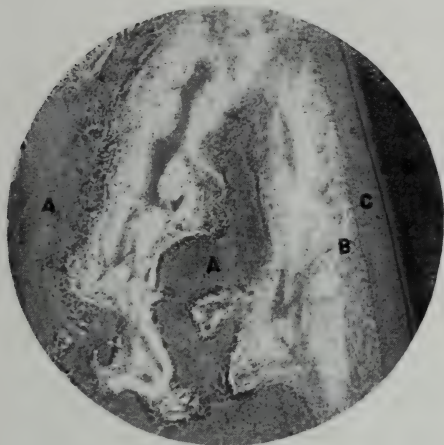
and the end of the root of a deciduous tooth. A larger area requiring a lower power would not show the osteoclasts as well as they are shown in this picture: A is the alveolar process, D the dentin, E the enamel, F the fibrous tissue left after the absorption of bone, K the fibrous dental sac, M the outer layer of the enamel organ, and O the osteoclast absorption seen about the bone and ce-

mentum of the root of the deciduous tooth. The remarkable thing about this picture, and others in my collection, is that although there is a space between the sac and the bone, something, apparently not pressure, is causing the osteoclasts to develop, and these in turn to absorb the bone and tooth root. It is possible that this space is due to shrinkage of tissues or dislodgment in preparation for the microscope. Note that the external epithelial layer is still in a normal healthy condition at the time of tooth eruption.

ABSORPTION OF BONE BY WEDGING TEETH.

Fig. 2 shows the margin of the alveolar process between the roots of two teeth. The dog was killed one week

FIG. 2.



(Magn. 36.)

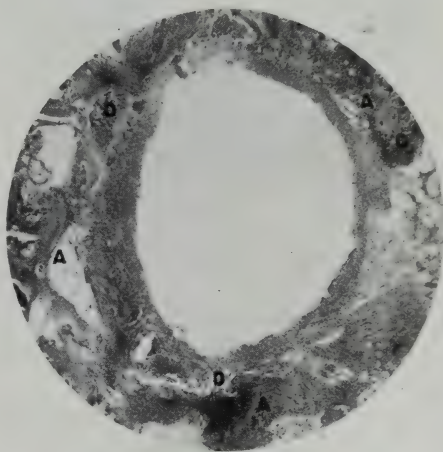
after the operation: A is the alveolar process, B the periodontal membrane, C the cementum, D the dentin.

The hole was drilled and the wedge lightly inserted some distance above the place from which the section was made. Wedging the teeth laterally has caused osteoclast absorption to occur, not only at the margin of the bone, but also upon the sides nearest the roots of the teeth. This picture is of unusual interest, be-

cause the osteoclasts are thickly located on the margin of the bone for the entire distance. It is unusual to see them so numerous.

Fig. 3 shows the alveolar process between the teeth at the gum margin. The wedge was driven in gently and the dog was killed one week after the operation: A shows the alveolar process, and O the osteoclast absorption along the margin of the bone. Absorption began at the edge of the cavity and extended away from the center. The absorption was

FIG. 3.



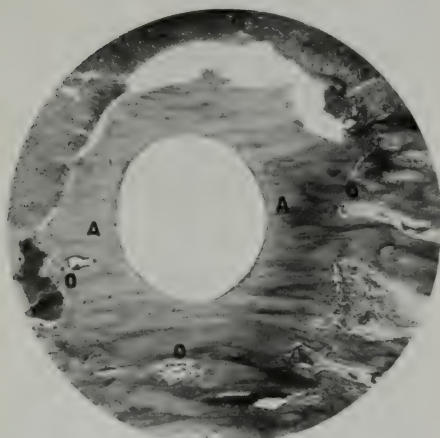
(Magn. 14.)

uniform except at the point where the cavity was nearest the root of the tooth. Here the bone is entirely removed, because the pressure acted in both directions.

Fig. 4 is taken with a low power in order to get a large area of bone. The wedge was driven in the cavity with as much force as would be used in driving a wedge between two teeth to make space to prepare to fill a tooth cavity. Note that the absorption does not take place at the margin of the cavity, as in the former picture, but at some distance from the edge: A is the alveolar process, O osteoclast absorption. In the lower border and at the sides, absorption is just beginning, while at the upper border the bone and some of the fibrous tissues are destroyed.

The absorption does not begin at one locality and proceed from that point, but from different localities, usually at

FIG. 4.



(Magn. 11.)

the Haversian canals where they approach each other. The bone between the cavity and the absorbed area has become necrotic, owing to the pressure,

FIG. 5.



(Magn. 11.)

which has caused stasis of blood. Lacunæ absorption is impossible because of stasis of blood in the bone area.

Fig. 5 shows still further bone absorp-

tion: A is the alveolar process, and o osteoclast absorption. The wedge was driven firmly into the cavity made by the drill, and the dog killed four weeks after the operation. The necrotic area is the same as that in the previous picture. The absorption, however, is further advanced. In this picture there is an absorbed area encircling the entire necrosed bone. If the dog had lived, in a few days the bone would have been exfoliated with the plug in position. In Figs. 4 and 5 the appearance of the bone structure is quite different from that in Fig. 3. In these two pictures the excessive pressure of the wedge caused a stoppage of the blood supply and disintegration of the cells, so that the staining power is lost—the affected part of the bone, as contrasted with the live bone in Fig. 3, becoming very pale and yellowish white, so that it can be recognized by the naked eye.

DRILLING HOLES THROUGH THE ROOTS OF TEETH.

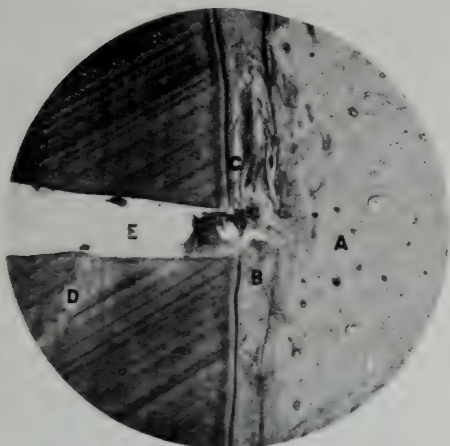
Holes were drilled through the roots of twenty-four teeth in various localities in different dogs. The dogs were killed two days, two weeks, six weeks, and eight weeks after the operation, with the following results:

Fig. 6 shows the root of a first premolar. This strong, healthy young dog was used for surgical experiments and was killed two days after the hole was drilled through the tooth. The hole was drilled with a small bur at as near right angles with the root as possible: A is the alveolar process, B the peridental membrane, c the cementum, d the dentin, and E the drilled cavity. Please note and bear in mind throughout this paper the relation of normal healthy tissues to each other, the width of the peridental membrane, the smoothness of the edges of the cementum and the alveolar border.

The drill passed through the peridental membrane and slightly touched the alveolar wall. The peridental membrane has penetrated the drilled cavity quite a distance. Tooth débris is seen in two

small spots in the cavity. Slight absorption of bone has already begun in this short period, owing to irritation. The

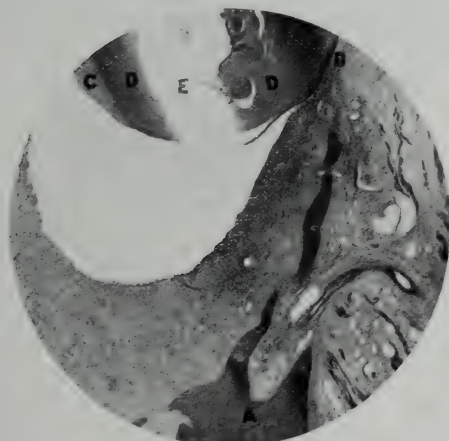
FIG. 6.



(Magn. 36.)

greatest difficulty we have to contend with, not only in dentistry but also in medicine, is the fact that absorption of bone and inflammation of soft tissues

FIG. 7.



(Magn. 14.)

than infection. I mention this here to impress it upon the minds of students, because many mistakes are occurring every day by our interpretation of X-rays, to the disadvantage of the patient.

Fig. 7 is taken at a low magnification to get as large an area of bone absorption as possible. This picture shows the root and bone of a young dog killed eight weeks after the operation: A is the alveolar process, B the periodontal membrane, C the cementum, D the dentin, and E is the cavity made by the drill. The bone is almost entirely destroyed about the roots of the tooth. All that remains is the outer surface of bone called "the outer growth lamellæ." So violent was the irritation that not only did absorption destroy the bone about the end of the root of the tooth, but a large area of fibrous tissue has also been destroyed. At the right of the drilled cavity may be seen the separation of the cementum from the dentin.

APPLICATION OF ARSENIC.

In making applications of arsenic to the teeth, an opening into the pulp chamber was made with a large bur. The bleeding was stopped and the cavity wiped out with cotton. Applications of arsenic on a shred of cotton were placed directly upon the pulp and sealed with zinc oxyphosphate. Eighteen teeth were so treated. The dogs were killed at the end of one, two, and four weeks.

One of the most interesting points observed is that the arsenic followed all the ramifications of the pulp, creating irritation, inflammation, and destruction wherever it came in contact with the soft tissues about the roots of the teeth. The larger the foramina the greater the irritation and inflammation.

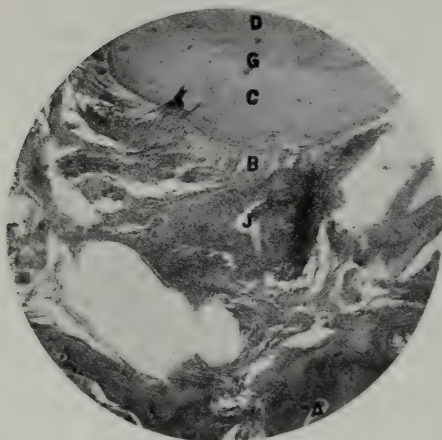
Fig. 8 is the end of a premolar root of a dog killed at the end of one week: A is the alveolar process, B the periodontal membrane, C the cementum, D the dentin, G the granular layer of Tomes, J active inflammation, and O osteoclast absorption.

At and in the granular layer are dis-

can occur from irritation as well as from infection. Indeed, we shall see before we have completed this paper that irritation has more to do with the pathology

tinctly seen a large number of canals or openings which are made very plain by the destruction of the soft tissue con-

FIG. 8.



(Magn. 24.)

tained therein. The destruction of the alveolar process is complete except at A, where a small amount of bone is seen. Active inflammation may be seen at J,

FIG. 9.



(Magn. 24.)

the normal natural foramina. At the right is seen absorption of the cement at the end of the root, while at the left two large openings in the cementum

pointing directly to the absorbed area are observed.

Fig. 9 shows the end of the root of a molar; the dog was killed six weeks after the operation: B is the peridental membrane, C the cementum, D the dentin, with a large absorbed area of the root. Absorption of the cementum is also seen at and above B. The entire alveolar process is absorbed away about the end of the root, while a destruction of the fibrous tissue is quite noticeable around the end of the root.

BONE ABSORPTION FROM IRRITATION DUE TO MATERIAL PASSING THROUGH THE ROOTS.

Fig. 10 is a low magnification taken just below the end of the root of a

FIG. 10.



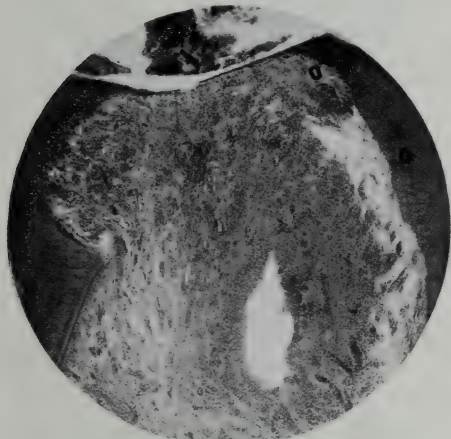
(Magn. 24.)

premolar, the object being to obtain as large a field of bone absorption as possible. The holes were drilled in such a way that the two pieces of protruding gutta-percha are pointing toward each other. The dog was killed at six weeks: A is the alveolar process, P the gutta-percha cones passed through the roots into the alveolar process, O osteoclasts located along and close to the bone. The main trunks of the arteries are seen in the lower part of the picture. Between

the tissues mentioned, the bone has entirely absorbed away. The appalling destruction of bone from such a slight cause was a great revelation to me.

Fig. 11 is a low-power picture to show the bifurcation of the roots of a molar. The root was filled in the usual way with a cone extending through the end of the root into the alveolar process. Inflammation has extended over the entire length of the roots to the bifurcation: *d* is the dentin, *o* osteoclast absorption. No alveolar process is present. Notice the

FIG. 11.



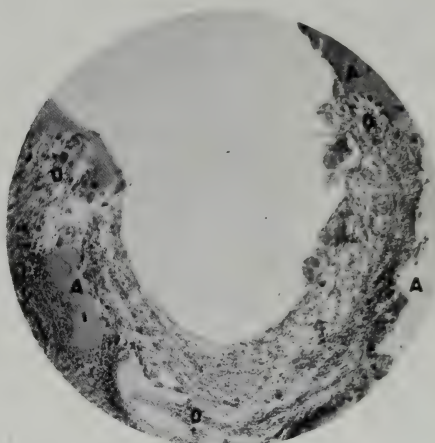
(Magn. 24.)

deep bay at *o*. With a hand magnifying glass may be seen the edge of dentin filled with cells. On the opposite side the cementum is entirely absorbed away. In the center and just below is an open space. Violent inflammation has occurred, resulting in the formation of a periodontal abscess.

Fig. 12 is taken from a molar root, and is located just below the cone. A large area of bone destruction as well as fibrous tissue destruction has occurred in a period of three weeks. This picture is taken in such a manner as to show a ring of the alveolar process about the absorbed area: *A* is the alveolar process, *o* osteoclast absorption. The osteo-

clasts are seen in large numbers throughout the entire bone structure.

FIG. 12.

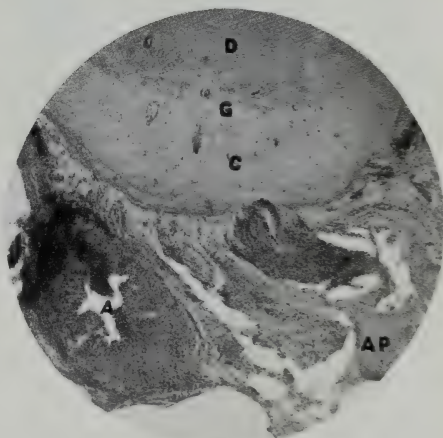


(Magn. 33.)

CARBOLIC ACID.

The application of carbolie acid was made by pumping it through the end of the root into the alveolar process.

FIG. 13.



(Magn. 30.)

Fig. 13 is the end of a premolar root of a dog killed at the end of a week: *A P* is the alveolar process, *c* the cementum, *d* the dentin, *g* the granular

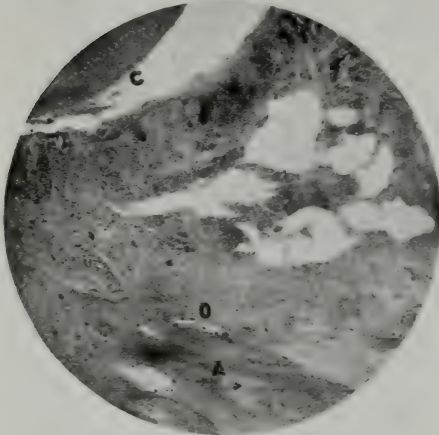
layer of Tomes; A shows a peridental abscess.

At and in the granular layer are distinctly seen a large number of canals or openings which are made very plain by the destruction of the soft tissue. The destruction of the alveolar process is complete except at A P, where a small amount of bone is seen. Active inflammation may be seen at the normal natural foramina. At the left, absorption of cement may be seen at the end of the root. The irritation is greater at the left of the inflamed area than at the right, because the diameters of the canals are greater than at the central foramina, allowing more carbolic acid to pass out at that locality. Liquefaction has occurred in the center of the inflamed area.

CREASOTE.

Fig. 14 shows the end of the root of a premolar tooth: A is the alveolar pro-

FIG. 14.



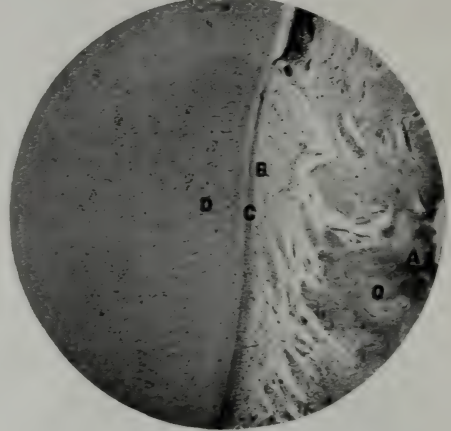
(Magn. 24.)

cess, C the cementum, O osteoclast absorption. The dog was killed one week after the operation. Extensive destruction of bone and fibrous tissue occurred at the apical end of the root.

Fig. 15 is a picture of the side of the root of a molar. The dog was killed four weeks after the operation:

A is the alveolar process, B the peridental membrane, C the cementum, and D the dentin. The gingival border may be

FIG. 15.



(Magn. 24.)

seen at the upper part of the picture. Creasote was forced through the end of the root. The pressure exerted, together with the creasote, sets up sufficient irri-

FIG. 16.



(Magn. 18.)

tation to cause absorption of the alveolar process in all directions, owing to its transitory nature. All the bone remaining can be seen at A.

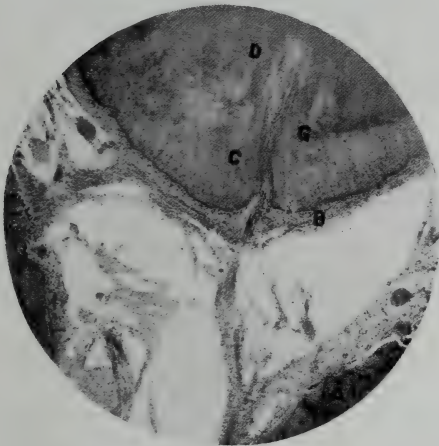
Fig. 16 is taken some distance below

the end of the root and to the side of the main trunks of the nerve, artery, and vein, which do not show in this picture. The dog was killed four weeks after the operation: *i* shows inflammation of the fibrous tissue, *o* osteoclast absorption. This is most interesting, since it shows destruction of both bone, which is quite necrotic, and fibrous tissue in a direct line with the pressure exerted by pumping air as well as creasote through the canals. Intense inflammation is seen along the margin of the track in the fibrous tissue. Osteoclast absorption is seen throughout the picture along the bone margin.

OIL OF CLOVES.

In these experiments four teeth were treated. The officinal preparation was

FIG. 17.



(Magn. 33.)

used. The drug was pumped through the end of the root in the usual way. The dogs were killed in one, two, and four weeks.

Fig. 17 shows the end of a root at the end of one week. While eight or ten foramina are seen in this picture, the central foramen is the largest. The destruction of tissue at the end of the root is considerable. The shape of the absorbed area shows that the force of pressure is in direct line with the canals and

through the medullary space: *A* is the alveolar process—a like amount of bone is seen at the right of the picture, all that is left in this area; *B* is the periodontal membrane, completely in position, showing that the irritation was exerted upon the bone, which has been almost entirely absorbed away; *C* is the cementum, *D* the dentin, *G* the granular layer. There is also destruction of fibrous tissue without inflammation.

OIL OF CASSIA.

Four teeth were injected with oil of cassia. The dogs were killed one, two, and four weeks after the operation.

FIG. 18.



(Magn. 36.)

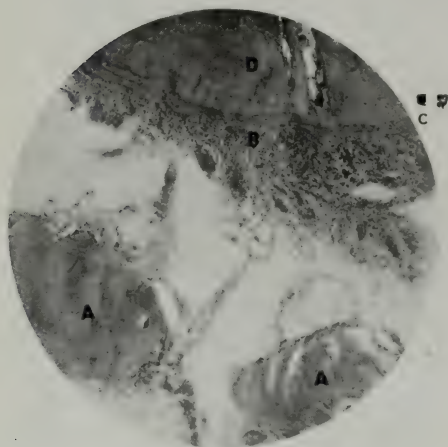
Fig. 18 shows the bifurcation of the roots of a molar: *A* is the alveolar process, *B* the periodontal membrane, *C* the cementum, and *D* the dentin. An artery may be seen in the granular layer between the dentin and cementum with malformation of structure. The alveolar process is almost entirely destroyed. Absorption of the cementum is also seen in different localities in the field.

GLYCOTHYMOLINE.

Applications of glycothymoline were made through the roots of six premolar teeth.

Fig. 19 shows the end of a root and a large area around it: A is the alveolar process, B the periodontal membrane, C the cementum, D the dentin. Osteoclasts may be seen around the edge of the bone. Two large canals are seen running parallel through the dentin, cementum, and periosteum. The one to the right seems to be the larger, although a greater amount of irritation has occurred at the opening of the one to the left, where most of the drug passed through. Some inflammation has occurred, but not enough

FIG. 19.



(Magn. 36.)

to cause an abscess. Active bone absorption extends throughout the picture, with destruction of the fibrous tissue in many places.

ALVEOLAR ABSCESS.

Fig. 20 shows a fully developed alveolar abscess upon the end of the root of a human bicuspid: A A is the abscess, A the alveolar process, B the periodontal membrane, and C the cementum. Three or four canals branch out fan-shaped from the dental pulp at the granular layer of Tomes. The periodontal membrane is destroyed for some distance upon each side of the end of the root. The bone has absorbed away some distance from the root, due to irritation,

and the sac wall has become organized out of the fibrous tissue. A small spicule of necrotic alveolar process came away with the abscess when the tooth was extracted. The pus in this case had burrowed its way along the roots of the tooth to the left to the surface.

FIG. 20.



(Magn. 16.)

In all of my other experiments for bone absorption the results are the same as already demonstrated.

THE AUTHOR'S CONCLUSIONS FROM THE EXPERIMENTS.

In commenting upon these pictures: The *first stage* in the process of bone absorption is irritation, and no matter whether the irritation be located at the gum margin or is interstitial in character, the process of bone absorption is the same. The process whether physiologic or pathologic begins with osteoclast absorption leaving the fibrous tissue in position. Indeed, the osteoclasts are held in position only by fibrous tissue. Absorption of bone, as we have seen, may be confined to a small area at the source of irritation, or it may extend from the end of the root to the gum margin and include the bone between the molar roots and the entire jaw, even destroying the superiosteal bone at the outer surface.

The fibrous tissue not infrequently remains, holding the tooth in position for years after the bone has been absorbed as observed in teeth to which plates and bridge work have been attached. It is also interesting to note that absorption of the cementum and later of the dentin occurs at the same time as the absorption of bone, and from the same cause. When once the absorption of cementum has occurred, it is rarely if ever reproduced. This statement is based upon its histologic development.

The *second stage* in the evolution of the pathology is a destruction of the fibrous tissue. This may take place following bone absorption or it may remain for years, depending upon the amount and severity of the irritation. The destruction of the fibrous tissue may be slight and take place quickly, or it may be as extensive as the bone absorption and slowly performed, or *vice versa*, leaving a cavity at the point of irritation. Infection may or may not occur. Notwithstanding all the precautions taken, I found it difficult to avoid infecting the tissues in some of these operations. The results, however, are very instructive. It will be noticed that in nearly every instance, peridental abscesses form and not alveolar abscesses.

The subject under discussion is not abscesses, but bone absorption, and these pictures were selected only to demonstrate bone absorption. In this series, however, peridental abscesses are shown in every conceivable position around the roots from the gum margin to the apex, which shows that infection can and does occur at places remote from the point of irritation.

One of the most interesting points in my entire researches, and shown in Figs. 11 and 18, is the extensive areas of absorption of bone and cement between the roots of the molar teeth and the formation of abscesses. Many theories have been advanced in regard to the cause. One of the latest is that they are due to drilling through the floor of the pulp chamber. This theory can hardly hold, because they are most frequently found in old dead teeth of long standing, when

the crowns and roots have turned dark and the alveolar process has been partly or wholly absorbed and the tooth structure perfectly normal.

My researches have shown that when irritation occurs at the ends of the roots from any cause, the irritation extends between the roots of the molars and on account of the bifurcations extends to the extreme limit, and at that point absorption and infection take place because the alveolar process is an end organ and terminal arteries center at that locality. Abscesses form between the roots for the same reason. Poisons are carried to that locality and lodge there, creating bone absorption, inflammation, and abscess.

It will be seen therefore, that the simplest irritants, such as pressure, air, and water, will produce irritation as readily as creasote, carbolic acid, arsenic, etc. In other words, in the treatment of root-canals the peridental membrane and alveolar process should not be injured in the least.

The *third stage* is the formation of abscess. Abscesses must occur after bone absorption and before the fibrous tissue is destroyed. Fibrous tissue after bone absorption, as I have shown, may remain at the end of the root for many years without further irritation or infection. When infection occurs, inflammation and abscess may develop. These may be alveolar or peridental, depending upon the locality. Peridental abscesses frequently occur in interstitial gingivitis from external infection, as well as in the interstitial tissues from apical infections. Absorption of bone, inflammation, and abscess occur without the knowledge of the patient. The patient is not aware that pathologic changes are taking place about the root of the tooth. There is no tenderness, pain, heat or swelling, or other clinical manifestations by which root-sepsis can be determined. It is only in the case of the alveolar abscess when the peridental membrane becomes involved and pus is burrowing its way through the dense outer plate of bone, that heat, pain, and swelling are produced.

Peridental abscesses and pulp abscesses are common in nearly every unclean mouth. Pus germs are carried in the blood (Rosenow) to terminal arteries like those in the alveolar process and pulp tissue. These abscesses form and heal without the knowledge of the patient. No doubt the loose cancellated bone structure around the roots has much to do with it.

The *fourth stage* is where the fibrous tissue is destroyed and a cavity remains at the end of the root. When the fibrous tissue is destroyed, bone restoration cannot possibly occur.

Duke* says, "Well-known pathologists say that granulating lesions in bone almost invariably heal and become organized into solid bone, unless there is a definite reason for their not doing so. The cause of failure of such lesions to ossify is usually infections, or a foreign body, or a sequestrum. If such obstacles to healing are removed, organization and ossification of the imperfect areas usually take place readily."

There are, however, other very good reasons why the bone is not restored in the alveolar process when these lesions occur at the apices of the roots. First, the cause is rarely removed. Second, the alveolar process being a transitory structure, is very rarely reproduced when once destroyed, even if the cause is removed. Third, absorption of the alveolar process is progressive because of the transitory nature of the process, hence the absorption is unlimited in its action. It will extend in either direction to the extreme.

In interstitial gingivitis, bone absorption may begin at the gum margin and extend toward the apex, or it may begin at the apex and extend toward the surface, as we have seen in the pictures. The point which I wish to make here is that it is not dead bone as some of our pyorrhea specialists claim, and, therefore, scraping of the bone or injury in any way is not indicated. Irritation with instruments only increases bone absorp-

tion. Where infection occurs (pyorrhea) it is the fibrous tissue that is involved, and not the bone. The same is true of abscesses, as we have seen—no matter where located, peridental or alveolar. Drugs or other irritants should not pass through the root because bone absorption will occur.

Researches have shown that 95 per cent. of all roots are imperfectly filled. After my twelve years of research upon this subject, the wonder to me is that the other 5 per cent. do not also show imperfections. When we consider the anatomy of the structures, how is it possible not to injure the tissues in our present methods of manipulation?

If we are fortunate enough not to injure the apical tissues in filling the roots, it is almost impossible to so seal the ends by mechanical means as to prevent gases from decomposed tissue passing through the peridental membrane and irritating the tissues. I am of the opinion that in the 5 per cent. of successful root-fillings, exostosis has partly or wholly closed the apical canal. Of the 95 per cent. of imperfections about the apical ends of the teeth, I am of the opinion that only a small percentage are affected by the streptococcus group of bacteria forming alveolar abscesses. In other words, in only a very few instances has infection occurred and abscesses formed.

It remains for future research to determine whether germs are present or not.

In studying these pictures showing the evolution of disease from health to alveolar abscess, it will be seen that X-ray pictures as produced today are far from what they should be. From a dental point of view, the X-ray is only a partial success. From a medical viewpoint, I have laid down the following axiom in my practice, A PATIENT'S HEALTH IS WORTH MORE THAN ALL THE TEETH.

If patients with one or more pulpless teeth are complaining of bad health, I do not hesitate to remove the pulpless teeth when all other sources of infection have been excluded. I have arrested arthritis deformans, cured headaches, in-

* Oral Sepsis in Its Relation to Systemic Disease," p. 52.

digestion, boils, skin eruptions, and large glands in the neck, supposed to be due to tuberculosis and other diseases, by removing pulpless teeth that did not show defects in the X-ray.

We have arrived at a very critical period in dental practice in regard to oral sepsis and focal infection. Are we to go on filling roots of teeth when we know that 95 per cent. of root-fillings are failures, and that many diseases of the body are due to imperfect root-fillings?—or shall we extract the teeth to be sure that systemic disease cannot oc-

cur? The work of the dentist is confined to the care of the teeth; should not his business be, above all others, to develop perfect teeth for his patients and thus avoid decay? Should not prophylaxis be the main aim and goal for the future practice of dentistry, since health, longevity, and happiness depend upon sound teeth?

Since this paper was written, a very able and timely editorial upon this subject has appeared in the March 1919 issue of the DENTAL COSMOS.

31 N. STATE ST.

The Use of Hypochlorites and Chloramins in Dentistry.

By RUTH FRANCES HOREL, B.A., M.A., San Francisco,

RESEARCH DEPARTMENT, DENTAL DEP'T UNIV. CALIFORNIA, THE CALIFORNIA STATE DENTAL ASSOCIATION, AND THE HOOVER FOUNDATION FOR MEDICAL RESEARCH,
UNIV. CALIFORNIA MEDICAL SCHOOL.

(Read before the California State Dental Association, July 1918.)

I. INTRODUCTION.

THE use of hypochlorites and chloramins in dentistry has recently been studied in the Research Laboratory of the University of California Dental College and the California State Dental Association. This investigation seemed opportune just at this time when infected war wounds in Europe are being so successfully treated with new antiseptics. However, the time has been short and the cases presented for treatment few, so that only a tentative report can now be submitted.

II. GENERAL REVIEW OF THE PRINCIPAL POINTS RELATING TO DAKIN'S SOLUTION AND THE CHLORAMINS.

Dr. H. D. Dakin, an American chemist and director of the Herter Laboratory, New York, was sent to France at

the beginning of the war by the Rockefeller Institute to carry on research work. In France he became associated with Dr. Alexis Carrel of the Rockefeller Institute, who has worked out the technique for the practical application of the new antiseptics.

Early in 1915, when Dakin and Carrel¹ undertook to find the best method for treating infected wounds, they chose that of chemotherapy. They considered it best to discover for a given antiseptic that concentration and that length of time of application which, while fatal to all parasitic life, would be harmless or non-toxic to the tissues. The result was a slightly alkaline solution of sodium hypochlorite—not a neutral solution as it is sometimes loosely described. This solution of sodium hypochlorite, which has been given the popular name of Dakin's solution, or the Dakin-Carrel solution, contains not less than 0.45 per

cent. nor more than 0.5 per cent. sodium hypochlorite. If the percentage of sodium hypochlorite is less than 0.45 the antiseptic power of the solution is too low; on the other hand, if it is greater than 0.5 the solution is irritating.

The solution must also be tested for alkalinity, which in this solution increases its stability, its irritating effect upon the tissues and skin, and its solvent action on necrosed tissue. It has been customary to use powdered phenol-phthalein and alcoholic phenol-phthalein for adjusting the reaction, but recently ortho-cresolphthalein² has been found to be a more delicate indicator than alcoholic phenol-phthalein for this particular solution. When using ortho-cresolphthalein as an indicator, a more stable and less irritating solution can be prepared, which is suitable for clinical use.

This sodium salt of hypochlorous acid may be prepared in any one of several ways. The method first used by Dakin is the double decomposition of calcium hypochlorite, or bleaching powder, and sodium carbonate. The alkalinity of this solution, after the calcium is precipitated as carbonate, may be neutralized by adding boric acid. However, the Rockefeller method of preparation in use at the War Demonstration Hospital presents the best technique. This method is available to any druggist. A second method is the action of liquid chlorin on sodium carbonate. This mode of preparation requires special apparatus for measuring liquid chlorin. Still another method, which requires special apparatus and an electric current, is the electrolysis of a sodium chlorid solution. Sodium hypochlorite rapidly deteriorates if exposed to the light. It is kept best in a brown bottle in the ice-chest. Owing to its instability it must always be titrated before use.

Dakin's solution is best suited for irrigating septic wounds. However, the hypochlorite, like any ordinary antiseptic, rapidly disappears when in contact with secretions, owing to its chemical combination with the proteins of pus, serum, and the like. This causes its penetrative and bactericidal powers to be

of short duration. To overcome this disadvantage continuous or intermittent irrigation is necessary. In contrast to the ordinary antiseptics this can be resorted to successfully, for Dakin's solution can be used in large quantities for considerable time without causing irritation and without signs of poisoning.

Sodium hypochlorite dissolves necrotic tissue and blood-clot, and kills streptococci rapidly, as well as neutralizing bacterial-split products or toxins. It attacks steel quickly, corrosion occurring within but a few minutes. It does not coagulate blood serum or other protein substances, and does not impair phagocytosis. The acceleration in the repair of infected wounds brought about by Dakin's solution is due merely to the suppression of micro-organisms. The dissolution of necrotic tissue helps to clean out pockets, and thus gives the solution the opportunity to come in contact with the bacteria lodged therein.

Without doubt, Dakin's solution is a valuable discovery, for as Col. Sir Almoth E. Wright has said, "It can be demonstrated that none of our ordinary antiseptics destroy microbes enveloped in dead or living tissue or in serous or purulent discharges, and that none diffuse into walls or recesses of a wound; the sterilizing action of the antiseptic applied to a wound will thus be strictly limited to the destruction of any microbes that may be lying bare."³

THE ADVANTAGES OF SODIUM HYPOCHLORITE IN THE TREATMENT OF SEPTIC WOUNDS.

The advantages of sodium hypochlorite in the treatment of septic wounds may be summarized as follows: (1) It is the cheapest antiseptic of the chlorin group and other effective bactericidal substances. (2) It has no toxic or irritating action on the tissues when properly prepared, and can be used in large quantities for three or four weeks without ill effects. (3) It has a remarkable deodorant action. (4) It causes the rapid separation of sloughs and the formation of clean granulation tissue. (5) It

possesses the velocity of action common to the halogens, which is in contrast to slowly acting antiseptics like phenol. When considering these advantages let us remember also what Sherman has said in his article regarding the treatment of war wounds: "Dakin's solution is not a panacea or cure-all, and while it has undoubted bactericidal properties and is an almost ideal antiseptic solution in that it is non-toxic and non-corrosive, it is not effective unless used with discretion and judgment. . . . The solution must be in constant contact with the tissues. . . . It is possible that Dakin's solution represents but 20 per cent. of the cure, and that the technique of Carrel represents 80 per cent."⁴

The killing of micro-organisms by antiseptics has been shown to be analogous to chemical reactions,⁵ one reagent being represented by the antiseptic and the other by the protoplasm of the bacterial cell. Among the chemical constituents of living cells capable of reacting with hypochlorites, the proteins are probably very important. It is suspected that at least one part of the action of hypochlorites upon proteins consists in the replacement of the H of some of the (NH) groups in the protein molecule by Cl, forming as a result substances of the chloramin group in which Cl is linked closely with N as NCl. This property of the hypochlorites is apparently responsible for their bactericidal action. This discovery led Dakin to take up the study of the chloramins, which are coal-tar chemical compounds. After studying many of these substances he selected para-toluene-sodium-sulfochloramid, as possessing the greatest number of desirable qualities and practically being the most useful. He gave it the name "chloramin-T." It is also known as "chlorazene" (Abbott Laboratories, Chicago).

CHLORAMIN-T (CHLORAZENE).

Chlorazene is sold in powder and in tablet form; also as a surgical cream and as a surgical powder. Chlorazene is soluble in water, and when in aqueous solu-

tion has a bitter taste. It is very similar to the hypochlorites in its chemical and biological reactions, but chlorazene has its advantages. Although it has but slight solvent action on necrotic tissue, it is less irritating than sodium hypochlorite and can be used in a concentration five to six times as great. It has been found to have a phenol coefficient of 54; that is, it is fifty-four times as efficient in antiseptic power as phenol. When acting in the presence of much blood it is more effective than sodium hypochlorite. It is also stable in tablet, powder, or solution. Light does not cause its rapid deterioration, as in the case of sodium hypochlorite. Chloramin-T, mixed with sodium stearate as a base, makes a paste which gives up its antiseptic ingredients slowly. When applied to the surface of a wound, sodium stearate disappears and chloramin is set free.

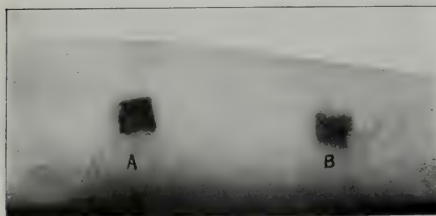
DICHLORAMIN-T.

Dichloramin-T, another synthetic antiseptic prepared by Dakin, and chemically known as toluene-para-sulfondichloramin, is a yellowish white crystalline substance which is stable if kept in the dark. It is insoluble in water, but soluble in chlorcosane, a chlorinated paraffin wax. Chlorcosane has taken the place of the medium previously used as solvent and diluent—namely, chlorinated eucalyptol and chlorinated paraffin oil. Chlorcosane is a light, straw-colored, and slightly viscid liquid, which should be transparent and free from any visible precipitate. Dichloramin-T, although used in as high as 10 or 20 per cent. concentration in surgery, should not be used on delicate tissues, as the skin and mucous membrane, in a higher concentration than 2 per cent. A 5 or 10 per cent. concentration is very irritating to the skin, and produces scar tissue resembling a burn. (See Fig. 1.)

When dichloramin-T is in contact with watery secretions such as come from wounds and mucous membranes, moderate amounts of antiseptic are given up. The oil acts as a reservoir for the antiseptic, which is liberated slowly during

a period of from eighteen to twenty-four hours, instead of from thirty minutes to one hour as in the case of the hypochlorite solutions. Dichloramin-T does not dissolve necrotic tissue or blood-clot. The bactericidal action of chloramins is due to the fact that constituents of living organisms, such as proteins and amino-acids, contain N in such a form that it can attract the Cl of the various kinds of chloramins. The chlorinating action

FIG. 1.



A, Scab formation on forearm resulting from 24-hour application of 10 per cent. dichloramin-T.

B, Scab formation on forearm resulting from 24-hour application of 5 per cent. dichloramin-T.

Note.—At the end of seven months both scars are still plainly visible.

of the chloramins is similar to that of the hypochlorites.

The war has brought into use other germicidal agents. Dyestuffs,⁶ although formerly used to destroy blood parasites, such as trypanosomes, have recently been used as antiseptics. The dyes employed in the treatment of war wounds include brilliant green and flavin⁷ or "acri-flavin."

In the use of Dakin's antiseptics in the treatment of war wounds, four procedures are recognized as essential for successful results: (1) Mechanical cleansing; (2) chemical sterilization; (3) bacteriological control; (4) closure of wound. With the use of an antiseptic, three conditions must be kept in mind: (1) Contact: An antiseptic can only sterilize tissues with which it comes in contact; therefore the importance of thorough mechanical cleansing can readily be understood. (2) Concentration:

When an antiseptic is brought in contact with wound secretions it is diluted, and its active substance is as a rule quickly spent inside of fifteen or thirty minutes. The only way the concentration can be kept up is by frequent applications. (3) Time: A wound cannot be sterilized in a few hours. Although a surface wound may be sterilized in twenty-four hours, infected war wounds generally require a longer time.

The bacteriological control is the guide as to whether a wound is surgically sterile. Smear examinations are relied upon. By means of a platinum loop specimens are obtained from a region of the wound where the secretions are not diluted by blood. This material is then spread evenly on a glass slide and stained for microscopic examination. When the number of bacteria in the microscopic field exceeds fifty or one hundred, there is no need of counting them more precisely, so the count for that wound for that day is registered on the chart as infinity. When the number of bacteria diminishes to fifty or below, the average number of several fields is registered on the chart, and the progress of the treatment can be readily seen at a glance. If the bacteriological chart does not show a diminution in the number of organisms, at least one of two or three reasons is evident: The solution is at fault, the wound has pockets with which the solution does not come in contact and which keep seeding the main orifice, or there is reinfection from the skin.

III. SPECIAL LITERATURE ON HYPOCHLORITES AND CHLORAMINS IN DENTISTRY.

In dentistry Dakin's antiseptics have been used in connection with pyorrhea treatment, root-canal work, alveolar abscesses, sterilization of the mucous membrane, and post-operative treatments, as well as in the treatment of wounds of the mouth and jaw.

FOR TREATMENT OF ROOT-CANALS.

H. J. Kauffer⁸ is very enthusiastic concerning his use of Dakin's solution. He

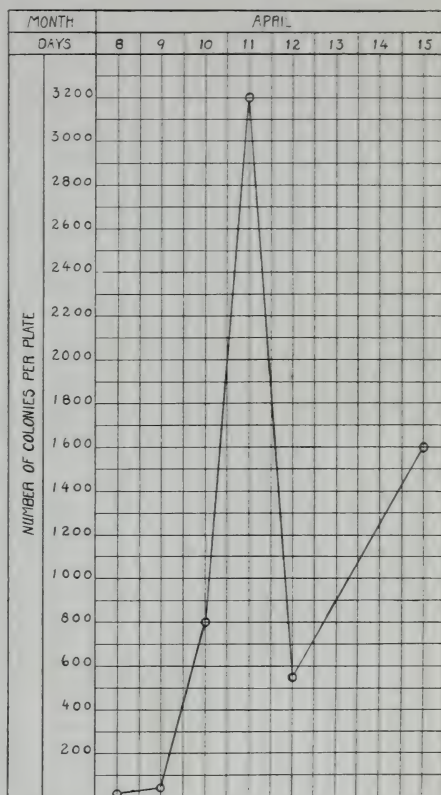
writes, "This wonderful antiseptic . . . is just as invaluable in dental practice as it is to the general surgeon. In dental surgery for post-operative irrigations and dressings, for irrigating pyorrhea pockets, and for sterilizing root-canals, it has no equal. I say this after several months' trial." His method for treating root-canals, after the rubber dam is in place, follows: Open up the canal through the apex, irrigate with Dakin's solution, and seal a saturated absorbent point in the canal for several days. He repeats this treatment as often as it seems necessary. To determine the bacterial condition of the canal, he seals in an absorbent point saturated with a sterile saline solution. After it has remained in the canal for a week it is incubated for forty-eight hours in broth. If no growth occurs, the root-canal is filled. If the broth is not sterile, another treatment or extraction is indicated. He states that personally he draws his conclusion from "the character of the organism."

PYORRHEA.

H. M. Beck⁹ has written a report of his experience with the Carrel-Dakin solution in mouth surgery. In pyorrhea cases to overcome marked inflammation and excessive bleeding, he gives Dakin's solution as a mouthwash: it is to be used every four hours for two days before prophylactic treatment. Pain during sealing and polishing is also lessened. His description of the treatment of one case is as follows: After the saliva ejector, cotton rolls, and gauze were in place, the gums were dried with a hot-air syringe. Dakin's solution was gently forced from a glass syringe on to the gums and into the pockets, where it was allowed to remain for five minutes. Following this treatment the solution was used as a mouthwash every two hours for two days. At the end of that time no pus or endamebæ were found, and the bacteria were not nearly as numerous as they generally are in an infected mouth. Dakin's solution was used as a mouthwash every four hours for the rest of the week. An examination of the

mouth weekly for six weeks showed that it remained in fine condition. The solution continued to be used as a mouthwash at night.

CASE A.



Lateral abscess under treatment with 2 per cent. dichloramin-T.

A loopful of material was placed in 10 cc. of broth, and 1 cc. of this mixture plated in blood agar. The bacterial count made from the blood agar plate was then registered on the bacteriological chart.

Note.—The rapid increase in the number of bacteria between the second and fourth days may be due to the opening up of heavily infected pockets.

Beck maintains that if the solution reaches the seat of infection undiluted with saliva, the flow of pus will stop in a few hours. If the pus continues, the solution has not come in contact with the point of the infection: treatment must be continued. In treating very large and

deep pockets, a small pellet of cotton saturated with Dakin's solution is in-

omitted, but each pocket is irrigated with the solution for three or four days. In cases where it seems difficult to reach the seat of infection, a fine wire is inserted into the pocket and a radiograph taken to find its depth and location. Beck also uses Dakin's solution after root amputations. He simply sprays the wound every two hours and cautions one not to use more than ten pounds pressure. To disinfect the mucous membrane before injecting novocain, he sprays the mouth with Dakin's solution and wipes the place of insertion with 70 per cent. alcohol. Finally he swabs the point for injection with Dakin's solution.

M. T. Barrett¹⁰ reports successful results when using Dakin's solution for pyorrhea cases and for apical abscesses with or without a fistula. In all cases suppuration ceased to gross appearance. No bacteriological controls were made. Before using the solution in pyorrhea cases he anoints the surface around the pockets with vaselin to avoid any possible irritation to the mucous membrane.

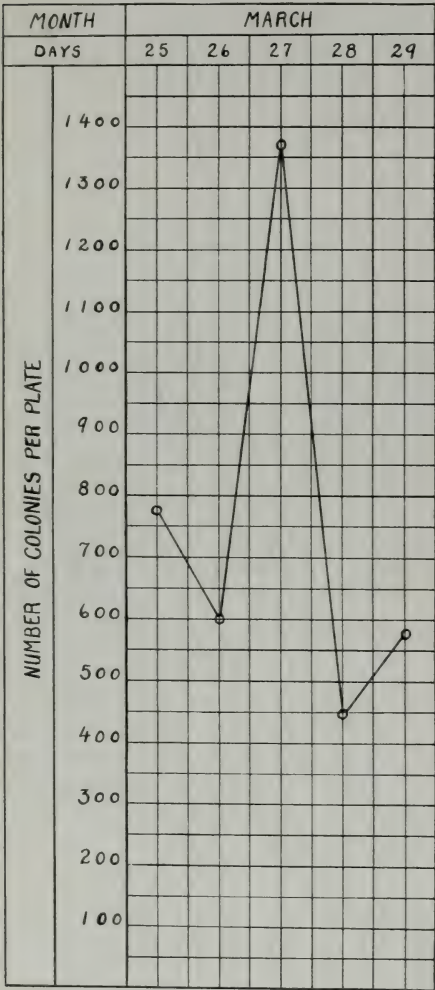
CHRONIC ALVEOLAR ABSCESSES.

John S. Marshall¹¹ cites one case in which he used Dakin's solution for abscessed teeth. The chronic alveolar abscess extended from the lower first bicuspid back to and including the third molar. A part of the alveolar process was necrosed and pus exuded from a fistula near the angle of the jaw. It had resisted all treatment for nearly two years. The fistula and pus tracts were irrigated every day with Dakin's solution. In the meantime the solution was used as a mouthwash and forced through the fistula as often as possible. The opening on the jaw was closed with sterile cotton. At the time he wrote the report the abscess was closing up. The discharge of pus was *nil*, and new granulation tissue was forming. He anticipated a complete cure in about two weeks. No bacteriological control was mentioned.

FRACTURES AND WOUNDS OF THE JAWS.

In the war zone, compound fractures of the jaw and flesh wounds involving

CASE B.



Pyorrhea pocket under treatment with 2 per cent. dichloramin-T.

A loopful of material was placed in 10 cc. of broth, and 1 cc. of this mixture plated in blood agar. The bacterial count made from the blood agar plate was then registered on the bacteriological chart.

serted into each pocket. A fresh dressing is applied every four hours for two days. In two or three treatments the flow of pus usually ceases. The dressing is then

the mouth have been treated successfully with a 2 per cent. aqueous solution of chloramin. Fisher¹² reports the use of the solution as an irrigant and mouthwash. Tubes were sometimes employed, according to the technique of Carrel. Irrigation took place every hour during the day and as often as possible during the night. Cases of gunshot wounds of the face and jaw treated with Dakin's solution, according to Carrel, have also been reported in civilian practice, and the usual successful results have been obtained.

IV. PERSONAL OBSERVATIONS.

In our attempts to treat cases with Dakin's antiseptics, difficulties have been encountered. The number of cases presented for treatment have been few, treatments were often irregular, and antiseptics other than Dakin's have sometimes been used just before our treatment was commenced.

(1) *Methods.* In treating pyorrhea cases Dakin's solution, chlorazene, and dichloramin-T have been used. Dakin's solution and 1 per cent. chlorazene were employed as an irrigant and as a mouthwash. When 2 per cent. dichloramin-T was used it was applied as a twenty-four-hour dressing after irrigation with one of the aqueous solutions. The piece of sterile gauze, saturated with the oily solution, was packed lightly in the pocket and held in place by a ligature.

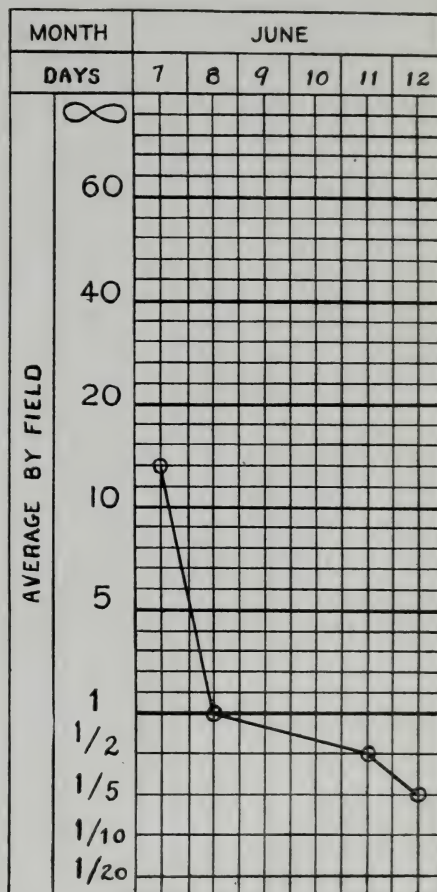
In chronic alveolar abscesses, with or without a fistula, the pus tract was irrigated with either Dakin's solution or 1 per cent. chlorazene. A sterile cotton point saturated with 2 per cent. dichloramin-T was sealed in with cement for twenty-four hours.

After root resections the wound was irrigated with Dakin's solution or 1 per cent. chlorazene. A sterile gauze pad saturated with 2 per cent. dichloramin-T was then applied daily for four or five days. Irrigation was continued for another week.

(2) *Results.* With the four pyorrhea cases which were treated with Dakin's solution or 1 per cent. chlorazene, treat-

ments were irregular. Some of the pockets were only irrigated twice a week. A mouthwash was given for frequent daily use. In certain cases where the

CASE C.



After root resection, treatment with 1 per cent. chlorazene and 2 per cent. dichloramin-T.

A loopful of material was smeared on a glass slide and stained for microscopic examination. The average number in twenty fields was then recorded on the bacteriological chart.

gums were prone to bleed easily, this condition was improved. Material for microscopic examination was obtained from the pockets. Sterile cotton rolls were placed around the teeth, and the

tissues were dried with a hot-air syringe. A sterile platinum loop was then inserted to the bottom of the pocket, and the loopful of material thus obtained was smeared on a glass slide. No striking diminution in the number of organisms per microscopic field was observed in any case. In the cases where a loopful of the material was introduced into 10 cc. of broth, and 1 cc. of this mixture plated in blood agar, only a slight decrease in the number of bacteria occurred. In the case treated with 2 per cent. dichloramin-T, similar bacterial counts were obtained.

With alveolar abscesses there have been no brilliant results with the four cases we have treated. One case with a fistula responded and clinically appeared much better during the two weeks of treatment, but pus reappeared after a week's rest. At no time during the treatment was the tract bacteriologically sterile. In the other cases pus still continued after daily treatment for a week.

After root resections the antiseptics have given better results. Of the four cases, all healed without suppuration. The bacteriological count decreased from twelve bacteria to less than one in twenty fields.

V. DISCUSSION AND SUGGESTIONS.

By comparing the results reported from the use of Dakin's solution with our own observations, it can be seen that much more experimental work is necessary before the value of Dakin's antiseptics in dentistry can be determined. Control cases are important. In one of our pyorrhea cases treated with physiological salt solution, results similar to those treated with Dakin's solution were obtained. When Dakin's solution is used as a mouthwash it probably has about the same effect as a salt solution, for the saliva dilutes the solution to such an extent that it no longer contains the percentage of sodium hypochlorite necessary in Dakin's solution. In a test tube experiment 10 cc. of a 0.5 per cent. Dakin's solution was mixed with 1 cc. of saliva and titrated immediately. The

resulting mixture gave 0.43 per cent. sodium hypochlorite.

Before we can accept any results from the use of these antiseptics we must have the bacteriological control as well as the clinical observations. Dentists must differentiate between an antiseptic and a deodorant. Many think that if after treatment with a solution the offensive odor is removed or disguised, everything is well. This is an erroneous conclusion, for the odor may be reduced but the infection continue. Enthusiastic statements such as Kauffer makes, cannot be accepted without further experimental proof. He failed to give the number of cases found sterile after his treatment, and the number he judged successful "by the character of the organism." Not much weight can be attached to conclusions like those of Marshall, which, without even the backing of a bacteriological control, anticipate a complete cure in two weeks' time.

Although we have not used Dakin's solution or 1 per cent. chlorazene to disinfect the mucous membrane before injecting novocain, my bacteriological tests with these solutions show that sterility of the mucous membrane can be obtained by swabbing with these solutions, as is the case with tincture of iodine.

Tests with Dakin's solution, chlorazene, and dichloramin-T show that they do not penetrate tooth structure.* Only surface sterilization may result when these antiseptics are sealed in root-canals. Dakin's solution when used as a mouthwash has no injurious effect on tooth structure or on fillings. Amalgam fillings are attacked only after several hours' exposure in the solution.

VI. CONCLUSIONS.

More experimental work with dichloramin-T should be undertaken, for it

* Only surface discoloration occurs when the antiseptic dressing is removed after different lengths of time and 20 per cent. starch potassium-iodid solution is applied. Freshly extracted teeth were used, and while the dressing was in the canal the portion of the tooth below the crown was kept in blood serum or physiological salt solution.

seems reasonable to suppose that substances like dichloramin-T and chloramin paste, which do not require renewal of application so often as the hypochlorites and aqueous chloramins, would be more practical in dentistry. The aqueous solutions are valuable in treating wounds of the face and jaw when the technique of Carrel or periodic flushing can be employed. If the aqueous solutions are found to be valuable to the dentist in civil practice, frequent application will probably be the keynote to success.

Before any real value can be attached to the use of Dakin's antiseptics in the oral cavity, many cases must be carefully controlled bacteriologically as well as carefully observed clinically. There must also be control cases treated with physiological salt solution. In this way the time factor and the bacteriological count of each treatment may be compared.

This investigation was undertaken at the suggestion of Dr. K. F. Meyer of the George Williams Hooper Foundation for Medical Research, and Dr. Guy S. Millberry, dean of the University of California Dental College. To them I wish

to express my thanks for their help and interest shown during the preparation of this report.

BIBLIOGRAPHY.

1. CARREL and DEHELLY. "Infected Wounds." New York, 1917.
 2. CULLEN and AUSTIN. *Journ. Biol. Chem.*, 1918, 34, No. 3, June, p. 553.
 3. WRIGHT. *Ash's Journal*, 1917, May-June, p. 180.
 4. SHERMAN. *Proc. Royal Soc. Med.*, 1916, x, Sect. Surg., p. 1.
 5. CHICK. *Journ. Hygiene*, 1908, 8, p. 92, and 1910, 10, p. 238.
 6. DAKIN and DUNHAM. "Handbook of Antiseptics." New York, 1917, p. 61.
 7. BROWNING, GULBRANSEN, KENNAWAY, and THORNTON. *Brit. Med. Journal*, 1917, 1, p. 73.
 8. KAUFFER. *DENTAL COSMOS*, 1917, lix, No. 8, August, p. 847.
 9. BECK. *Ibid.*, No. 10, October, p. 974.
 10. BARRETT. *Ibid.*, No. 4, April, p. 446.
 11. MARSHALL. *Ibid.*, 1918, lx, No. 2, February, p. 176.
 12. FISHER. *Brit. Dental Journal*, 1916, July, p. 246.
-

Diseases of the Dental Pulp.

II. Etiology. III. Classification.

By HERMANN PRINZ, M.D., D.D.S., Philadelphia, Pa.

(Continued from page 316.)

Etiology.

WHEN a patient suffering with pain in a tooth which contains an aching pulp appeals to us for treatment, it is our paramount duty to ascertain whether the diseased pulp is amenable to conservative treatment, or whether it should be destroyed. From a clinical point of view it is imperative to locate, if possible, the morbid cause of the disease, *i.e.* its etiology. The early removal of the cause and the prevention of its return as instituted by the physician frequently produces a "cure"—the *healing of the lesion*, while the return of pathologically altered tissue to normal physiologic function is accomplished by nature. In the words of Celsus this dogma is expressed as *Natura sanat, medicus curat*.

The causes of diseases of the dental pulp are identical with those which are responsible for the production of pathologic disturbances in other tissues of the body, and, in accordance with the accepted standards of the practice of the medical art, may be referred to as being either primary or secondary in their nature. The causes may be mechanical, chemical, thermal, electric, or parasitic in their nature. All of these causes produce local manifestations. The primary causes, as their name implies, attack the pulp directly, such as an infection from a carious defect; while the secondary causes select an indirect route—such as those arising from a pericementitis or an osteitis.

The vast majority of the causes which are responsible for pathologic distur-

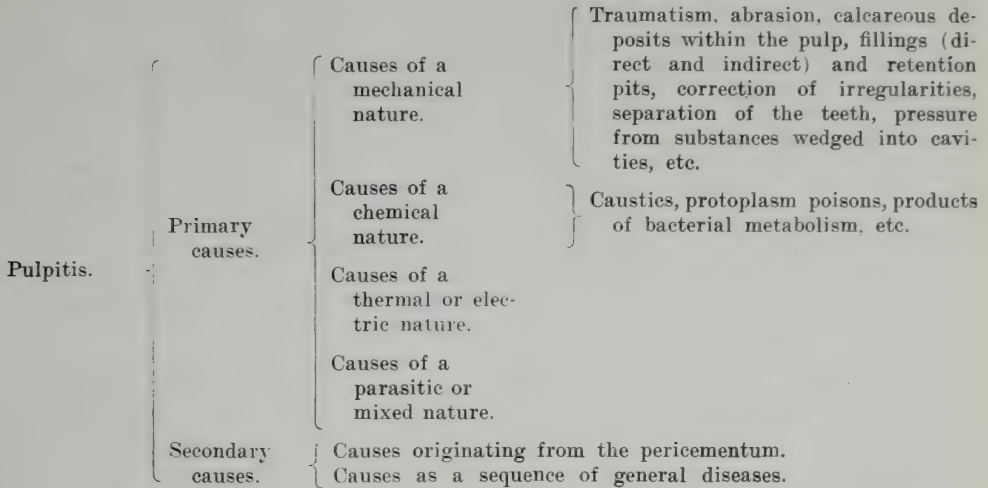
ances of the dental pulp find their origin in a direct or indirect association with the infective process of the hard structure of the tooth, *i.e.* a streptomycosis of a mixed type. The very same organisms which are closely associated with the carious process are always predominant in an infected dental pulp.

To facilitate the ready classification of the etiologic factors of the diseases of the dental pulp from a clinical point of view, the schematic outline shown on the following page will be found of service.

CAUSES OF A MECHANICAL NATURE.

Traumatic disturbances of the pulp are manifold in their character and are commonly met with in clinical practice. Such accidents as a fall, a blow, or being hit by some solid object, are of frequent occurrence. Children and those adults who indulge in the various types of sports are prone to be injured about the teeth. Because of their prominence, the upper anterior incisors suffer more often than the other teeth. Sport accidents, such as a fall in skating, etc., usually cause typical fractures of the upper centrals. Accidents such as the breaking of a tooth during extraction are also frequent occurrences. During the excavation of a carious cavity the pulp is often accidentally exposed;—a fracture of the tooth crown may directly expose the pulp, or it may occur in such close proximity to this organ that it becomes advisable to destroy it at once. A careful examination of the broken

Schematic Outline of Causes of Pulpitis.



surface with a magnifying glass and a sterile explorer is of great service in discovering a possible minute opening.

An exposure of the pulp must always be looked upon clinically as an infection, and it should be treated accordingly as outlined under "Treatment of the exposed healthy pulp." If the tooth as a whole is loosened, an effort should be made to retain it, if possible, in its normal position by ligatures, splints, etc. After the tooth has again become firm, it may be tested by the electric current to ascertain the state of the pulp.

Mechanical destruction of tooth structure through abrasion is primarily observed in the aged. In case of loss of the posterior teeth, the anterior teeth are often called upon to bear the entire force of mastication, and as a consequence abrasion of these teeth at their incisal edges takes place. Irritation of the exposed dentin causes a renewed physiologic activity of the pulp which results in deposition of adventitious dentin in the pulp chamber. Frequently it is insufficient to keep equal pace with the rapid process of abrasion, and in due time the pulp becomes involved. Certain occupations such as sand-blowing, glass-cutting, tool-grinding, etc., in which the atmosphere is charged with abrasive dust are prone to cause marked wasting of

tooth structure. Skulls of Bedouins, like the nomadic tribes inhabiting the sand-saturated atmosphere of the Sahara desert, exhibit pronounced tooth abrasion. The "pipe-stem hole" of the clay-pipe smoker, and the "blow-hole" of the glassblower are typical examples of localized abrasion. Seamstresses, who are in the habit of biting threads, occasionally also exhibit localized abrasion of the central or lateral incisors, although more often periapical disturbances are observed in these cases from the direct force applied to the long axis of the tooth.

Calcareous deposits within the root-canal, either as adventitious dentin or in the form of pulp nodules, are of very common occurrence indeed. Occasionally they produce very obscure types of idiopathic pulpitis which may baffle the most expert diagnostician.

The preparation of a deep-seated cavity for the reception of a filling, and retention pits which are located within close proximity of the pulp, are frequent sources of pulp hyperemia. In these cases the additional thermal changes of the metallic filling must be taken into consideration. Intense force employed in malleting a gold filling has caused the death of many pulps.

The too rapid movement of a tooth for the purpose of correcting an irregu-

larity, or the application of quick and intense force in the mechanical separation of teeth, may occasionally produce severe types of hyperemia or even death of the pulp by strangulation. The use of rubber strips for separating teeth, which was so frequently employed for such purposes in former years, is especially prone to cause pain about a tooth. In removing the rubber dam, small circles may be torn from it and remain under the free margin of the gum, and when left unobserved, the resilience of the rubber causes these rubber particles to move upward, impinging upon the peridental membrane, and pericementitis and subsequent pulpitis may be the result. Direct pressure from substances forced into a deep cavity in which the pulp is exposed or covered by a frail layer of dentin, such as in taking an impression with modeling compound, or food being crowded into it, may cause pulpitis.

CAUSES OF A CHEMICAL NATURE.

Chemical irritants such as acids, sweets, protoplasm poisons, and metabolic products of bacteria are common etiologic factors of pulpitis. The acids of dental cements have destroyed many pulps.

Impure cement powders containing traces of arsenical compounds will cause death of the pulp. Silicate cements are often supposed to be especially destructive to the pulp. These cements are not any more irritating to vital tissue than the oxyphosphate cements, but they are better conductors of thermal changes. Recent improvements in the manufacture of silicate cement powders have eliminated the presence of arsenical impurities. Sweets, by their hygroscopic nature, are usually only temporary irritants, while certain protoplasm poisons, especially arsenic trioxid, are intentionally applied to destroy the pulp. If arsenic is present as an impurity in any one of the various filling materials, it will assert its very powerful deleterious effect very promptly. Arsenic present in almost infinitesimally small quantities,

i.e. one part to one million parts of the filling compound, is known to have killed the pulp. Acid fumes, especially those of inorganic acids, are the greatest enemies of tooth structure. They dissolve tooth substance and thereby expose the pulp. Among the organic acids, the damage done by tartaric acid in the so-called "grape cure" should be mentioned.

Pulp irritation from thermal changes, as stated above, is very common. This is especially the case with deep-seated metallic fillings.

SHOCKS FROM ELECTRIC DISTURBANCES.

Shocks from electric disturbances within the oral cavity which manifest themselves in a painful response of the irritated pulp are quite frequently observed. In instances in which electro-positive and electro-negative metals are simultaneously employed within close proximity as filling materials or as prosthetic appliances, the presence of saliva completes the electric circuit. Gold is an electro-negative metal, while aluminum and amalgam with their predominance of mercury are on the positive side. The interposed saliva acts as an electrolyte, and through ionization a voltaic circuit is completed which manifests itself in a migration of the positive ions to the negative ions, and thereby a measurable amount of electricity is evolved. Incidentally, through the process of ionization of saliva, which always contains sodium chlorid, hydrochloric acid is formed at the positive pole. If, for instance, a gold clasp supporting a denture is placed about a tooth containing a large amalgam filling, the acid set free at the point of contact dissolves the tooth structure, and from the electro-motive force created the gold band may break.

CAUSES OF A PARASITIC NATURE.

Causes of a parasitic nature producing pulpitis are more often met with than any other known disturbances. Bacterial invasion of the dental pulp is prob-

ably always due to a mixed infection in which the streptococci are predominating over other types. Cognizance must be taken of the chemical metabolic products concomitant with the bacterial invasion, *i.e.* acids, ptomains, toxins, etc., and the simultaneous action of mechanical and thermal disturbances. The bacterial invasion of the pulp occurs in the great majority of cases directly from the carious process or indirectly by way of the pericementum near the free margin of the gum tissue. In the manifestation of secondary pulpitis, infectious borderline diseases which involve the accessory cavities of the nose and the tissues surrounding the teeth are frequently responsible for this disturbance. Such febrile diseases as acute nasal catarrh, influenza, malarial fever, pneumonia, and others are especially prone to be causative factors. Invasion of the pulp by bacteria from hematogenous causes, via the circulation, are comparatively rare.

SECONDARY PULPITIS.

Secondary pulpitis as a sequence of a local or a general disease is by no means a rare occurrence. In the majority of cases the underlying disturbance is an infection, although general diseases of a non-infectious type, such as leukemia, locomotor ataxia, anemia, or increased intradental blood-pressure, etc., may be the exciting factors. Of the infectious diseases, acute nasal catarrh involving the antrum is probably more often concerned with secondary or idiopathic pulpitis than with any other borderline disturbance, although other infections of a general character affecting the mucous lining of the nose or the circulation as a whole, such as influenza, pneumonia, scarlet fever, measles, malaria, etc., must be mentioned. Infectious disturbances of the temporomaxillary joint, *e.g.* acute mandibular arthritis, are prone to cause secondary pulpitis in the teeth of the lower jaw.

III. Classification of Diseases of the Dental Pulp.

Concerning a classification of the various diseases of the pulp—the *nosology*—quite a confusion exists in our current literature, and even in many of our textbooks, unfortunately, a detailed discussion of this interesting subject is usually avoided. Not alone is this apparent laxity of clinical inquiry appalling to the searching student, but he is also confronted with a gross neglect of correct pathologic terminology. Hyperemia, inflammation, and gangrene are the usual routine terms selected to designate the bulk of the various types of pulp disorders. Hyperemia has been called irritation of the pulp, which in itself is a misnomer, as irritation is the *cause* and not the disease. This is equally true in referring to inflammation as a disease. The collective term “pulpitis” is generally employed to designate generically all stages of inflammation of the pulp. Again, gangrene, a term which is utilized to cover the various phases of dead pulp tissue, is referred to as a disease,

while in reality it is the sequence of necrosis, *i.e.* the necrotic pulp is acted upon by specific organisms, which results in gangrene. Obviously, a dead pulp cannot be “treated,” as it is no longer “diseased.”

From a purely pathologic point of view, Arkövy has probably presented, so far as known, the most subtle division of pulp diseases. For clinical purposes, however, this division is too complicated. Many other classifications have been brought forward, among which we may cite the classic schemes of Rothmann and of Black, and those of John Tomes, Wedl, Adolf Witzel, Abbott, Miller, Boedecker, Burchard, Roemer, Walkhoff, Hopewell-Smith, Fischer, Colyer, Kantorowicz, and others. To construct a scheme of classification of diseases of the dental pulp which answers all purposes equally well is quite difficult, and is very largely a matter of the personal equation. However, there are certain unalterable pathologic facts which must

be observed as being fundamentally essential for a suitable division. Ordinarily we refer to a sound, healthy pulp as a normal pulp; this very term, however, needs some further amplification. The tooth pulp should be looked upon as a transitory organ. Normally, with the completion of the tooth its function is accomplished, and from that period retrogressive changes take place within its own tissue which may, under suitable conditions, lead to complete atrophy or other types of degeneration. At some other time, however, its activity as a constructive organ may be called upon, after calcification of the tooth is accomplished. As the result of some form of stimulation it may deposit adventitious dentin and pulp nodules for the purpose of protecting its own integrity, or some other factors of over-stimulation may lead to the formation of a hyperplastic growth, *e.g.* a pulp polypus. As it is a very vascular organ, any disturbance of its integrity will manifest itself in the typical reaction of tissue to an injury—*inflammation*.

The primary manifestations of the inflammatory process always occur at the place of entry of the disturbance, *i.e.* usually in the coronal portion of the pulp. As a sequence, a partial acute simple pulpitis is the result. The character of the severity of the infection determines the rapidity of its progress. Within a comparatively short space of time, usually within a few hours, or rarely days, total inflammation of the pulp quickly follows the initial disturbance. To differentiate clinically between a partial and a total acute pulpitis—*which, incidentally, is merely a quantitative, not a qualitative manifestation of the inflammatory process—is very difficult, if not impossible.* From the viewpoint of the clinical pathologist there is no valid reason for such a subtle diagnosis, as the treatment of both grades

is exactly the same. The progressive increase of the acute infection leads to the formation of a localized collection of pus, *i.e.* an abscess, or to a general purulent infiltration between the spaces of the connective tissue cells, *i.e.* a phlegmon. Again a partial or a total purulent pulpitis is the sequence, which for the above-stated reasons need not be diagnosed separately.

Most acute types of pulpitis terminate in a surprisingly short time in necrosis or gangrene. Under certain conditions, however, the acute form may assume a chronic stage. The preliminary requirements for the change from an acute into a chronic pulpitis are a pulp possessed of a high degree of vitality and free drainage of the formed exudate, *i.e.* an open pulp chamber. The various stages and final results of chronic pulpitis are manifold; usually two types are diagnosed, namely ulcerative pulpitis and hyperplastic pulpitis. The former type is more frequently observed in adults, while the latter is more predominant in the neglected mouths of children. An intermediate subacute grade of chronic inflammation occasionally occurs, and is known as parenchymatous pulpitis. In most instances the latter is the predecessor of the numerous types of degeneration of the pulp.

INFLAMMATION—DESTRUCTIVE OR PRODUCTIVE.

As has been stated above, inflammation of the dental pulp may manifest itself as a destructive or a productive process. All acute types of pulpitis are destructive in their nature, while the chronic types represent the productive, often wrongly referred to as the "constructive" group. This classification, which is based upon manifested histopathologic symptoms, is still frequently employed by clinicians, and may be depicted as follows:

(A)

Acute destructive pulpitis (the pulp usually is *not* exposed):

- (1) Acute simple pulpitis.
- (2) Acute purulent pulpitis.

(B)

Chronic productive pulpitis (the pulp usually is exposed):

- (1) Chronic ulcerative pulpitis.
- (2) Chronic hyperplastic pulpitis.

It will be observed that the above classification does not take any special cognizance of such important clinical manifestations as the exposed healthy pulp, hyperemia of the pulp, degeneration of the pulp, secondary pulpitis, and necrosis and gangrene.

The exposed healthy pulp, in reality, should not be included in the diseases of the dental pulp proper. However, as the exposed pulp, from a clinical point of view, must always be looked upon as an infected tissue, and one which as a consequence requires treatment, a discussion of the procedure of protecting the exposed pulp is imperative, and therefore its insertion at the beginning of our grouping (see below) seems justified.

Hyperemia of the dental pulp portrays a clinical manifestation of pulp disturbance which in actual practice is probably more often met with than any other type of disorder of this organ. Its correct diagnosis and the subsequent method of treatment is of the utmost interest to the clinical practitioner.

Clinically, degenerations of the pulp do not form a group of recognizable diseases, as they cannot be diagnosed *in situ*, hence their discussion is of less interest to the practitioner. Generically, they constitute an important part of special pathology, and are referred to in our grouping only from the viewpoint

of the general practitioner in order to complete the chain of clinical pathology.

Secondary or idiopathic pulpitis usually manifests itself as hyperemia, or in rare instances as any one of the inflammatory types of pulp disorders, or as necrosis. As its name implies, its secondary manifestations are always the sequence of some primary disease. Clinically, these borderline diseases play a most important rôle in the routine work of the general practitioner, hence they are entitled to special consideration.

Death of the pulp, *i.e.* necrosis and its sequence, gangrene, as stated above, must not be classified as "disease." Clinically, its frequent occurrence and its sequelæ are of vital importance to the practitioner, consequently the removal of the dead pulp tissue and the subsequent treatment of the pulpless tooth need to be discussed in detail.

In the following classification it has been our aim to formulate a grouping of the disorders of the dental pulp from the viewpoint of the clinical practitioner. Its object is to present a working basis for the *ultima ratio* of all clinical procedures, namely, the application of rational therapeutic measures, in the broadest sense of the term, for the purpose of relieving and favorably modifying the evolution of disease:

Classification of Disorders of the Dental Pulp.

- | | |
|-----------------------------------|--|
| (1) THE EXPOSED HEALTHY PULP, | (6) CHRONIC HYPERPLASTIC PULPITIS. |
| (2) HYPEREMIA OF THE DENTAL PULP. | (7) DEGENERATION OF THE DENTAL PULP. |
| (3) ACUTE SIMPLE PULPITIS. | (8) SECONDARY PULPITIS. |
| (4) ACUTE PURULENT PULPITIS. | (9) DEVITALIZATION OF THE DENTAL PULP. |
| (5) CHRONIC ULCERATIVE PULPITIS. | (10) NECROSIS AND GANGRENE. |

(To be continued.)

Root Resection: A Plea for a Broader Field.

By Captain HAROLD J. PARKER, Dental Corps, U. S. Army.

NOT a great while ago, root resection, root amputation, or apicoectomy, as it is variously called, was regarded only in the light of a procedure of last resort. In fact, a few practitioners still have this attitude toward it, but within the last few years most progressive dentists have come to the realization that this procedure occupies a legitimate place in the realm of dental surgery. They no longer wait until all therapeutic measures have failed—covering perhaps a period of five or ten years, or until X-ray examination discloses an enormous radiolucent area—and then resort to surgery with little expectation of good results, other than that the probable ensuing extraction will be made easier. But now we know that this attitude toward the operation was as unreasonable as the operation was useless from the standpoint of saving the tooth.

We might say that the attitude toward root resection has changed, and it is now being resorted to by most men much sooner than would have been the case ten years ago. It may be said that this is the procedure of all men employing it—as those who use it only as a last resort, or in old chronic cases, soon discard it, for under such conditions it is by no means successful.

This operation, however, has been given a little encouragement recently, and as a result its indorsement is being heard more and more every day. I am firmly convinced that it is destined to advance still farther before it reaches the place it deserves, and it is to that end that this communication is presented.

CLASSIFICATION OF APICAL INFECTIONS.

For the purpose of this paper, all apical infections are divided into four groups:

Group I.

- (1) Cases with no X-ray evidence of pathological change beyond the apex.
- (2) Cases with perhaps the slightest appreciable X-ray evidence of such change.
- (3) Cases with no history of local symptoms.
- (4) Cases with history of recent local symptoms of an acute condition and of short duration.

Group II.

- (1) Cases showing small, well-defined areas of destruction as disclosed by the X-ray.
- (2) Cases with small granulomata, or osteitis of the condensing or rarefying type.

Group III.

- (1) Cases in which there is a medium-sized rarefied area shown by the X-ray.
- (2) Cases with slight resorption of the root.
- (3) Cases in which medication has failed.

Group IV.

- (1) Cases in which there is X-ray evidence of large areas of tissue destruction.
- (2) Cases with areas of cystic appearance.
- (3) Cases with considerable resorption of the root.
- (4) Cases in which medication has repeatedly failed.
- (5) Cases of long standing.

Group I is intended to include only those cases in the primary stage of infection, cases which respond readily to careful medication and as a rule remain cured. It is needless to say that this paper will not deal with these. Our present methods produce as high a percentage of cures as we can expect from any form of treatment.

Group II might be characterized as including cases of subacute nature. Only cases showing *small* pathological radiolucent areas are included here—cases just past those defined in group I and yet a long way from an extremely chronic condition. Generally speaking, we have grouped here those conditions which have held out so much promise to medication and yet have persistently resisted permanent cure for so long.

Group III is intended to include infections which have passed the stage of group II, but are not so far gone as the conditions enumerated under group IV. Here is where resection is generally considered indicated today.

Group IV includes conditions calling for extreme measures. It was in such cases as these that root resection was first resorted to, but, as these cases are generally past all redemption, little success was obtained until the field was broadened to include the conditions classed under group III.

It is with group II that most progressive dentists are interested, for it is just here that the most discouraging results of all root-canal work have been met with.

The treatment of apical infections was just being approached with a degree of certainty when we learned through Rose-now and others of the significance attached to radiolucent areas about apices of quiet teeth. The realization came over the profession that the methods in use were inadequate, and since then there has been a continual effort to find a satisfactory procedure. Technique after technique with as many different drugs have been advanced only to be discarded after a short popular existence.

HOPELESSNESS OF THERAPEUTIC MEASURES.

As each therapeutic measure has come out we have seen hundreds of infections eradicated in print, but the general practitioner has seen very few that would stand the practical test. We have listened to papers, illustrated by X-rays showing apparently absolute eradication and cure of this class of infections, but, with all due respect to the gentlemen who are working in the interests of our profession, the majority of ordinary practical men cannot repress the thought "That's all very fine, but show us the teeth."

After all, the entire burden of proof in these cases has rested upon a poor little shadowgraph. Any good X-ray man can cure granulomata, as far as the picture is concerned, in a very few minutes. I do not mean to suggest any wilful deceit, but wish simply to voice the sentiment of the ordinary practical men, who all feel that much which they have heard is not so beautiful as it is pictured.

My skepticism concerning some of these miraculous cures has been justified by my experience in the army dental corps. Having but little confidence in any known method for the eradication of infections of the type we have designated as group II, a less conservative policy was adopted which involved surgical procedure in many cases which a year ago would have been treated therapeutically. From observations on between sixty and seventy cases, only one case was found that did not disclose at least twice as much tissue destruction as indicated by the X-ray. This showed conclusively that considerable tissue disturbance may exist without detection by the X-ray. It indeed proved to be very strong evidence against the X-ray as an accurate index to periapical conditions.

If some of our ardent advocates of conservative therapeutics could have observed the amount of necrosis present in many of these cases, their conservatism would have received a shock. Cases showing comparatively small, harmless-

looking granulomata in the X-ray revealed at operation large pathological areas.

I must confess that I am not optimist enough to believe it possible to cure these conditions by drainage and medication through a root-canal. But our advocates of medication have bounded from one theory to another and the passing years show a disappointingly small percentage of cures. It seems that all our theories have availed us little other than the realization of the impossibility of curing these cases through a root-canal.

As a result of repeated failures in this direction, there is no denying the fact that the medical profession has lost patience with us and has little confidence in any of our theories of medication. It is quite common to have a medical man, when referring a patient to us for the removal of possible foci, insist on extraction.

SURGERY THE ONLY RATIONAL PROCEDURE.

It is my firm belief that all cases which have passed beyond the stage of group I should be treated surgically. The field for resection has, within the last few years been broadened, and this move has been fully justified. Now let us broaden it still farther. Then shall we begin to find the solution for that problem which has baffled our profession so long.

Everything points toward it. Medication has been given every opportunity and failed. The results of efforts at rendering the root-canal as nearly as possible sterile, or of pumping various medicines through the apex, or of forcing ions into the mass beyond, have, we must admit, proved insufficient. We should begin to realize that nature, with the little aid we can give through a root-canal, is incapable of resorbing or rendering inactive these pathologically changed tissues.

Why then should we hesitate to resect in these cases? After we have performed a thorough curettage we know that we have removed all the granulosomatous and necrotic tissues and have given nature

a fair chance. This is more than we could have even hoped for with the old methods.

Those who have been opposed to this operation have said much about the cut surface of the root; that we have removed all possible means of attachment—the cementum, pericementum, and peridental membrane. I have always regarded this very much in the light of a convenient excuse for failures which should have been blamed on the unwise selection of a case, *i.e.* one that is too far gone, or on a miserable technique.

The condition of the apical tissues actually observed at operation is so convincing that conservative theories in this direction are not practical. It was obvious that these tissues could never be of any further use to the tooth involved, or to the maxilla, and that if any kind of reattachment were ever to take place it could only come as the result of thorough excision of this tumefied and dead mass.

As to fears regarding the operative cavity, it ought to be sufficient to know that nature obliterates this with first granulation and then with firm connective-tissue formation. Subsequent X-ray examination, in the face of a negative clinical picture, should be disregarded, as it would by no means indicate an infection. As we have removed the great bulk of infected tissue, we have every reason to expect nature, with a high degree of vascularity, to care for any remaining sepsis.

If the wisdom of this procedure is to be disproved, it is not by the X-ray alone. I feel that the more a man learns about interpreting X-rays, the less confidence he has in them. If we are to be convinced that our cases have failed, provided the area is not growing progressively larger, it will not be on this kind of evidence. Shadows about the apex after operation should not have the same significance as might be attached to them before it. A possible means for accurately checking up these cases might be developed by the use of the dental trocar devised by Dr. Coriell of Baltimore (see DENTAL COSMOS for December 1918, page 1154).

As to the retention of the tooth in the socket, these cases (group II) require so little of the root to be sacrificed that fears in this direction are groundless.

Since coming into the service it has been my good fortune to resect roots before a great many medical men, and I can say with assurance that this operation has their enthusiastic approval. They seem greatly surprised to find dentists doing this kind of work, and their respect for the profession is increased as a result. It appeals to them as a

logical means of removing possible foci of infection, and when once this becomes generally known by them it is doubtful if they will accept anything in the line of medication for these conditions.

Medication has had its trial in the class of cases we have been considering, and has been found wanting. Let us not waste any more time in that direction. If we are to cope successfully with the situation we must turn to surgery.

U. S. GENERAL HOSPITAL No. 14,
FT. OGLETHORPE, GA.

Treatment of Ununited Fractures of the Jaws:

RÉSUMÉ OF WORK DONE BY

Dental Department, U. S. Army Gen. Hosp. No. 11, Cape May, N. J.

By First Lieut. D. H. MCCAULEY, D.C., U. S. A., Laurel, Mont.,

CHIEF DENTAL SURGEON

AND

First Lieut. B. L. WORTHLEY, D.C., U. S. A., Kansas City, Mo.,

ASSOCIATE.

(I.)

IN reviewing the work done in any single hospital it is well to consider, in a general way, the type or types of cases which have been treated, and to note the condition in which they were received.

Many military surgeons have, when reviewing their work, called attention to the fact that war surgery has presented problems and difficulties quite different from those met in a civil practice. And of these problems and these difficulties the military dental surgeon has had his full share, particularly in the treatment of fractures of the jaws which were the result of gunshot wounds.

While fractures of the maxilla and mandible met with in civil life are seldom complicated by a loss of substance,

in the war injuries which we have treated such a loss is the rule rather than the exception. These men have received their wounds anywhere from six weeks to four months previous to coming under our treatment. Five of the cases had no previous treatment, and in many cases the treatment was of but a temporary nature; the other injuries and general condition of the patient being such that no real reparative work could be undertaken. In many cases a foul and inflamed condition of the oral mucous membrane required our immediate attention, and the replacing of the fragments in their proper position of itself presented a problem.

The condition of patients arriving in this country coincides with the progress

of the organization of the maxillo-facial service abroad; cases of injury occurring before the 1st of September were not, as a rule, in good condition. The service was in operation in certain hospitals during the Château-Thierry drive, and from this time on, with few exceptions, cases that went through American hospitals (evacuation bases) in France were in good condition, although, for lack of proper materials, considerable ingenuity had to be used at times to produce splints. Splints were made from two-franc pieces, chicken-wire, telephone wire, or anything in the shape of malleable metal that could be obtained. In connection with this an amusing incident happened; in June 1918 a major in the dental reserve corps in great distress of mind called his chief over the phone because he was swamped with wounded and had no materials with which to work, and wanted to know what he was going to use to make splints. His chief, who was facing the same difficulty, replied, before slamming up the receiver, "Use your wits!"

Except as the most temporary expedient, wiring is absolutely contra-indicated in fractures associated with loss of bone substance. The teeth wired nearly always become loose, allowing motion to the jaw. In addition to this, the teeth are forced from their normal position, so that when an attempt is made to place a splint in the mouth it is quite impossible to tell how the teeth originally occluded.

Nearly all surgeons agree that it is particularly essential that no loose fragment of bone if attached—as even a small piece of bone will have periosteum attached—should be removed from the site of the fracture, as is sometimes done; for pieces of bone apparently hopelessly injured will often recover their vitality and serve as a valuable matrix for repair. Even should some of the fragments be thrown off later, we have found that bone fills in more rapidly than where an extensive curetment has been made and these small pieces removed.

We believe that few cases of fracture of the mandible with appreciable loss of

substance can be successfully treated with a splint applied to the lower jaw only, especially where the points for fixing the splint are widely separated. Under these conditions there is a tendency, if the lower jaw is allowed to open, to prevent bony union, and to put so great a strain upon the teeth that they become loosened, which in turn further increases the mobility of the parts. This is exactly what happened in one of the cases which we shall describe later.

NECESSITY OF IMMOBILIZATION OF THE JAWS.

While from four to six weeks is often enough time for the firm union of simple mandibular fracture, immobilization for from three to four months is always necessary to secure union where there is the loss of substance which accompanies most gunshot wounds of the jaws. Many ingenious mechanical appliances have been devised which will allow the opening and closing of the jaw and at the same time maintain the fragments in their proper relation. Few if any of these devices have been successful in the most essential feature, viz, maintenance of the fragments in their proper relation. It has been found necessary, therefore, to immobilize the jaw to attain this end.

As has been pointed out by others, when the teeth are in absolute occlusion the muscles of mastication are not relaxed, or in the rest position, but are under strain. Immobilization of the jaws with the muscles in this strained position, slight as the strain may be, results in great discomfort, as may be easily demonstrated. Bring the teeth to absolute occlusion and notice the strain and tenseness of the muscles of mastication; also, when in the same position, try to swallow or talk. Now allow the jaw to come to rest, and notice how much more comfortable the muscles are, how much easier you can talk and swallow. Writers on dental prosthesis have called attention to this fact, and state that the anterior teeth lack about 3 mm. of occluding when the jaw is in the rest position.

Our reconstructed models were accord-

ingly mounted upon Gysi simplex articulators, and the bite was opened to a dis-

FIG. 1.



Shows jaws in rest position.

tance of 3 mm., as shown in Fig. 1. The splints were then constructed so that

FIG. 2.



Shell fragment wound. Scar that produced a serious case of trismus; was relieved by an operation. Picture before operation; forcing jaws apart unsuccessful until after operation.

the jaws could be held firmly together and yet have this space between. It is evident, however, that this method is

practicable only where the fracture is anterior to the angle. When the fracture is at the angle or in the ascending ramus, fixing the jaws in the rest position would permit a widening of the space, or a V-shaped gap, which, when it filled in, would prevent the patient from ever getting the teeth into occlusion.

The danger of trismus following the prolonged but necessary immobilization of the jaws caused no little concern at first—as it has been held that such prolonged immobilization is likely to result in trismus; our practical experience, however, shows that this factor may be totally disregarded.

We have thus far treated forty cases of trismus, in all of which there has been scar tissue about the condyle or in the muscles of mastication. The fact that

FIG. 3.



Shows scar after operation, jaws forced apart. Double result was obtained in this case; disfigurement removed and trismus cured.

those occurring in temporal muscles have been the hardest to rectify goes far to prove Col. V. P. Blair's contention, that trismus is not caused by immobiliza-

tion of the jaws *per se*, but by some inflammatory process about the joint or within the muscles of mastication. Aside from a slight temporary stiffness of the muscles we have had not the slightest evidence of trismus on removing splints, many of which have been locked in place from four to five months, and three for six months. In a case which we shall describe later the splints have been in place four and one-half months.

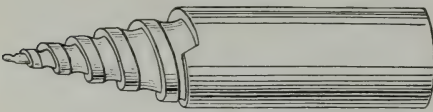
In our treatment of trismus, daily massage of the scars in the muscles and the gradual forcing the jaws apart gave the desired result in all but one case. In this case, shown in Figs. 2 and 3, the scar was removed by an operation performed by Major G. V. I. Brown, in the "plastic and oral surgery" service.

For the gradual forcing of the jaws apart, a simple tapered screw turned in

splint, made in two pieces and fastened together by the pin-and-tube method. Such a splint was described by Moufang in the November 1918 issue of the *DENTAL COSMOS*, although we had been using it for some two months before the appearance of his article. We believe the cast aluminum splint to be a decided improvement over those made of poured metal. First: It is stronger in proportion to its weight and bulk. Second: If, after the splint has been made, additional attachments are found necessary, they can be cast separately and attached to the main portion by puddling. Third: Should the splint break, it can be repaired by the same method. In fact, the only disadvantage we can see is that it requires the use of a casting machine, which is not always available in field service.

The technique for the construction of such a splint is briefly as follows: The first step is, of course, the proper preparation of the models and mounting them upon an articulator. We have been using for this purpose Gysi simplex articulators. A single sheet of base-plate wax is adapted to the teeth and made to fit closely about the gingival margins. Undercuts can be taken care of by filling them in on the plaster model. When gaps occur, additional wax is added and rounded off. This strengthens the piece and makes it more cleanly. The wax is cut out on the occlusal surface to allow the jaws to come to their proper relative position. As before mentioned, if the fracture is anterior to the angle, the teeth are not put in absolute occlusion, but the jaws are allowed to assume the rest position; should the fracture be at the angle or in the ascending ramus, the wax is cut out until the teeth are in absolute occlusion. The tubes are also made up in wax. This is done by making small wax tubes, 4 mm. long, over a No. 12 gage wire pin. Two of these tubes are fastened to each buccal side of the lower wax model and one or two to each side of the upper. They are adjusted so that they form one continuous tube when the jaws are brought together. Any additional attachments which may

FIG. 4.



Screw used in treating trismus.

hard wood is effective. Such a screw is shown in Fig. 4. It can be used by the patient himself, if necessary, for a few hours each day. The muscles seem to contract more at night during normal sleeping hours than at any other time. To overcome this, each patient was given a cork with a wire attached, to place between the teeth before going to bed. The cork was changed for one of a larger size at regular intervals. In from two to four weeks these patients were able to open the jaws—perhaps not so widely as before the injury, but at least to an extent sufficient for all practical purposes. While sufficient time has not as yet elapsed to state positively, we believe that the results obtained are permanent.

TYPE OF SPLINT USED.

The most successful interdental splint in our hands has been a cast aluminum

be needed can be carved in wax and put on at this time. Such attachments might take the form of lugs to which ligatures splints clean. In fact, if the splints are poorly polished it is next to impossible to keep food débris from collecting on

FIG. 5.



Shows wax models ready to invest.

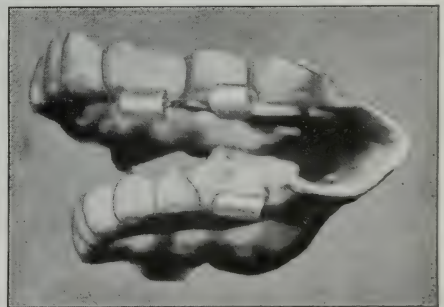
or wires may be fastened for the gradual reduction of the fracture, or inclines for the teeth to guide the fragments into proper position. These attachments were found necessary in a number of cases.

The wax is then removed from the plaster model and invested—wax gates, of course, being put in position first. Fig. 5 illustrates the wax models ready for investing. In investing, the wax is first carefully painted with a fairly fine investment and then further invested and flaked in a coarse one. Each wax model can be flaked separately, or two can be successfully cast at the same time by joining the main gates after the first investment has been applied, and then flaking in a single flask. Fig. 6 shows a pair of splints cast at one time before the gates were removed and the splints finished.

After casting, the gates are cut off and the splints sandpapered and given a high polish. We believe this polishing should be done carefully and thoroughly, as it makes it much easier to keep the

them, causing no end of discomfort to the patient and worry to the dental surgeon, and frequently resulting in gingivitis and kindred conditions. It is bad

FIG. 6.



Shows splints before being finished. Note that a pair was cast at a time.

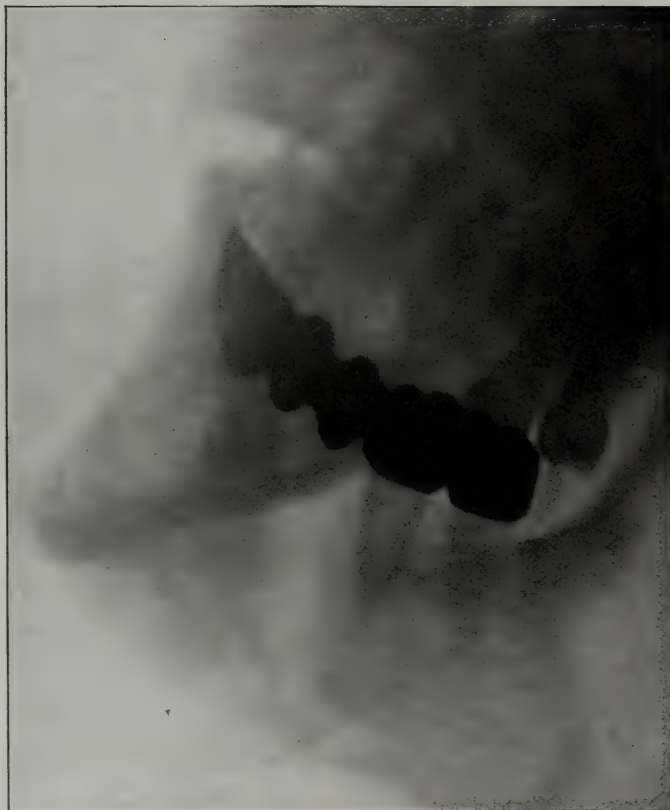
enough to wear splints, without this added source of irritation. A highly polished splint, well fitted, tends greatly toward a successful outcome.

The splints are cemented into place separately, the fracture reduced, and the pin inserted into the tubes with the end of the pin bent over to hold it in position.

Such a splint has all the advantages of an interdental splint made in one piece, with none of its disadvantages. It is

might strangle in his own vomitus. We have had several cases in which the ordinary splints have been torn loose by violent coughing. Should it become necessary to remove a sequestrum on the palatal or lingual side of the jaw, this can be done with the pin-and-tube splint without disturbing the splints or dis-

FIG. 7.



Note gold bridge over fractured area, also relation of lower left third molar to upper left third molar. The lower first molar was destroyed; posterior fragment forward 1 cm.

more easily and quickly constructed than the swaged splint. It will immobilize the jaw and yet allow for the rapid opening of the jaws in an emergency such as might arise from vomiting or violent coughing. In the case of vomiting from seasickness or other cause, it can be readily seen how a patient with the old-fashioned interdental splint in place

placing the retained fragments to any appreciable extent, and with a minimum of discomfort to the patient. The cementing of the splint into place is often a trying procedure for both the patient and the operator. The pin-and-tube type of splint permits the dividing of the operation, as each splint may be placed independently of the other, thus

giving the operator more time to get the splints and fragments properly aligned.

In cases where it is necessary to insert a bone-graft, this splint is ideal, as it allows for the rapid opening of the jaws at any stage of the anesthesia, and at the same time gives the surgeon a solid base on which to work. During the convalescence it effectively immobilizes the parts, which is one of the absolute essentials for a successful bone-graft.

After primary union has taken place in cases of comminuted fracture, the mandible must be given some support for a period of from three months to a year, depending upon the comminution and whether or not there is loss of substance. It is obviously impractical both to continue the use of splints and to keep these cases in the hospital for such a long period after union has taken place; we have therefore, in handling such cases, resorted to heavy gold fixed bridges, which in addition to furnishing the necessary support provide prosthetic restoration at the same time. Figs. 7 and 18 illustrate two cases so treated. By this procedure we have been able either to discharge the patient from three to six months sooner than would otherwise be possible, or to grant him an extended furlough.

DIET.

Food and fresh air are important factors in the treatment of any fracture. In all of the cases where the jaws have been immobilized, a liquid or semi-liquid diet is necessary. We were fortunate in having the co-operation of a very able dietician. Following closely the diet advised by Kazanjian, we secured most excellent results. The basis of dietary for each twenty-four hours is four pints of milk, four eggs, and two pints of soup. A goose-neck porcelain feeder or half-inch glass tube is used to administer the food. The men were fed at regular intervals and between times; milk was always available. Although this diet contains adequate nourishment for an able-bodied man, yet the very monotony of it was the cause of constant and insistent

complaint, many men becoming very sullen and discouraged. They were therefore served a greater variety of liquids and semi-solids. Having a large number of cases, it was thought that instead of feeding them in their rooms, the seating of these men together at a large table away from other patients might prove a stimulus to their appetites and improve their dispositions as well. This plan has proven highly successful. Our dietician personally supervises all meals and will allow no man to leave the table until he declares that he is no longer hungry, all complaints regarding food being thereby eliminated. It is gratifying to report that in every case there has been a gain in body weight of from five to thirty pounds. The men take an interest in what is being done for them, and are cheerful and contented. We also wish to speak of the advantages of work to occupy their time. This we are able to prescribe in the "curative workshop," which keeps up the morale during treatment, and which is one of the contributing factors toward a successful outcome.

Before taking up the detailed description of the cases, it might be well to give a brief general outline of the difficulties that must be overcome in treating gunshot wounds of the jaws.

These wounds are caused by bullets or shell fragments, both of which create great havoc in all tissues with which they come in contact. The wounds inflicted are all infected wounds, and the fractures are always comminuted and compound. During the process of healing more or less sloughing must necessarily take place, which adds to the destruction caused by the original injury and to the amount of scar-tissue formation. In all of these cases there is a loss of bone ranging from a few centimeters to half of the jaw or even more, these often being complicated by one or more simple fractures of the remaining fragments. Added to these difficulties, the fragments are bound down to a greater or lesser degree by scar tissue, it often being necessary to cut adhesions and free scars before alignment of fragments can

be attempted. Often the tongue, the cheek, or a lip and one or more of the fragments are bound together in a mass of scar tissue, and occasionally the lips are so contracted as to prevent the insertion of any prosthetic appliance. These

FIG. 8.

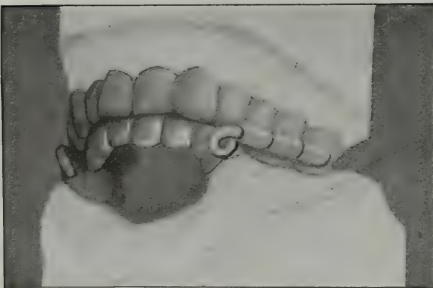


Shows position of fragments on arrival at hospital.

conditions of course must be dealt with surgically before any prosthetic work is attempted.

By the time the cases reach this hospital, the wounds in the soft tissue are for the most part healed. In a number

FIG. 9.



Shows splints on model.

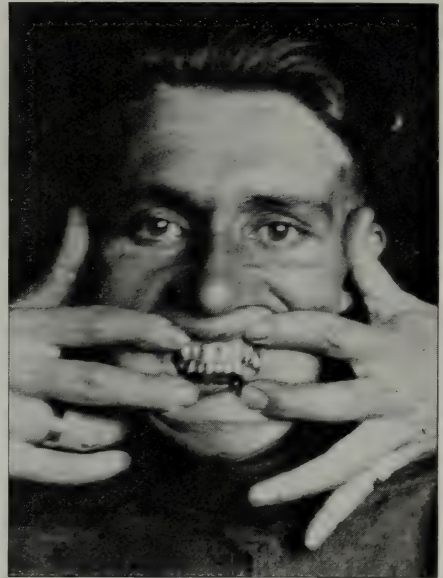
of cases we had old sinuses to contend with, some of which drained externally and others into the mouth cavity. From these sinuses numerous pieces of bone, some even with teeth attached, were removed from time to time as they became loosened.

Case Reports.

FRACTURE OF THE BODY OF THE MANDIBLE WITH LOSS OF SUBSTANCE IN WHICH THE POSTERIOR FRAGMENT HAS BEEN DRAWN FORWARD.

We treated one hundred and forty-seven cases of fracture with loss of substance occurring in the body of the mandible, and twenty-seven cases in which the posterior fragment had been moved forward, either overseas or at this hos-

FIG. 10.



Shows splints cemented on. Note destruction of mandible.

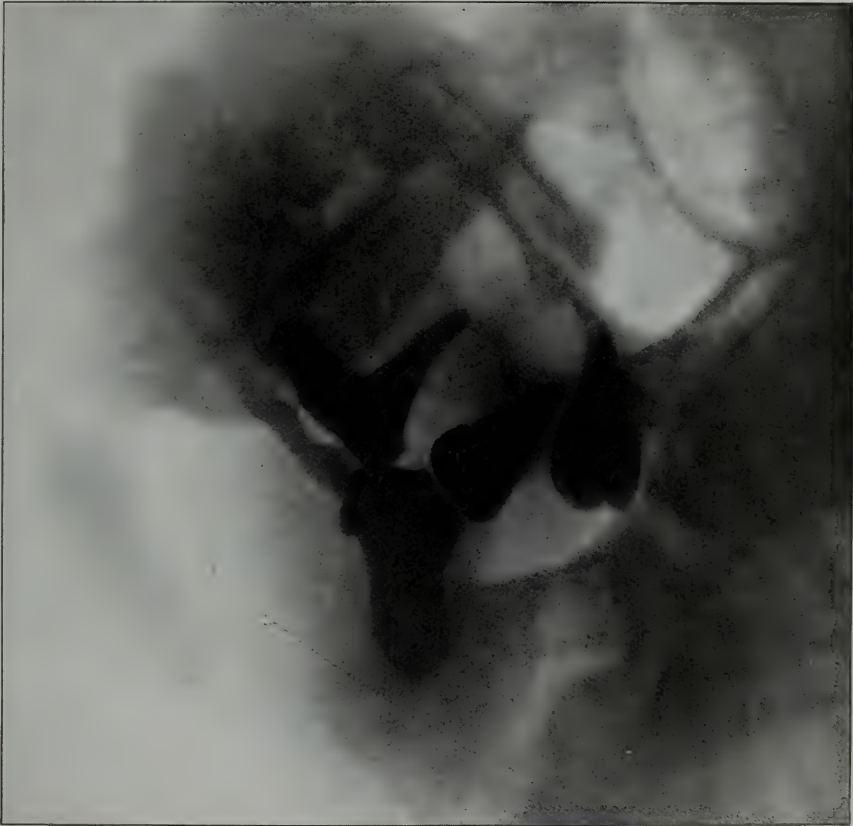
pital, and saw, as it were, the end results. When the ramus is intact and the loss of bone is from 1 to 3 cm., and if firm teeth are present in the posterior fragment, it is very easy to immobilize the parts. But if no teeth be present and the posterior fragment has not moved forward of its own accord, we believe that if the loss of bone be not greater than 3 cm., an open operation should be performed and the fragments drawn together, or part of the way, by silver wire, and the jaws immobilized. If

deemed advisable, a bone-graft can be inserted at this time. We have received two cases from overseas in which the fragments were drawn together by this method, a good result being obtained in each case. We shall describe a typical case in which the posterior fragment was drawn forward by splints, and an-

cemented in place, holding the fragments in normal position.

Patient arrived at U. S. A. Gen. Hosp. No. 11, Cape May, New Jersey, October 3d. X-ray (Fig. 7) showed 2 cm. loss of bone. Lower splint loose. October 5th, absent without leave. Returned October 30th, with splint off, pa-

FIG. 11.



Shows case before bone-graft was inserted. (December 1, 1918.)

other case in which it came forward of itself.

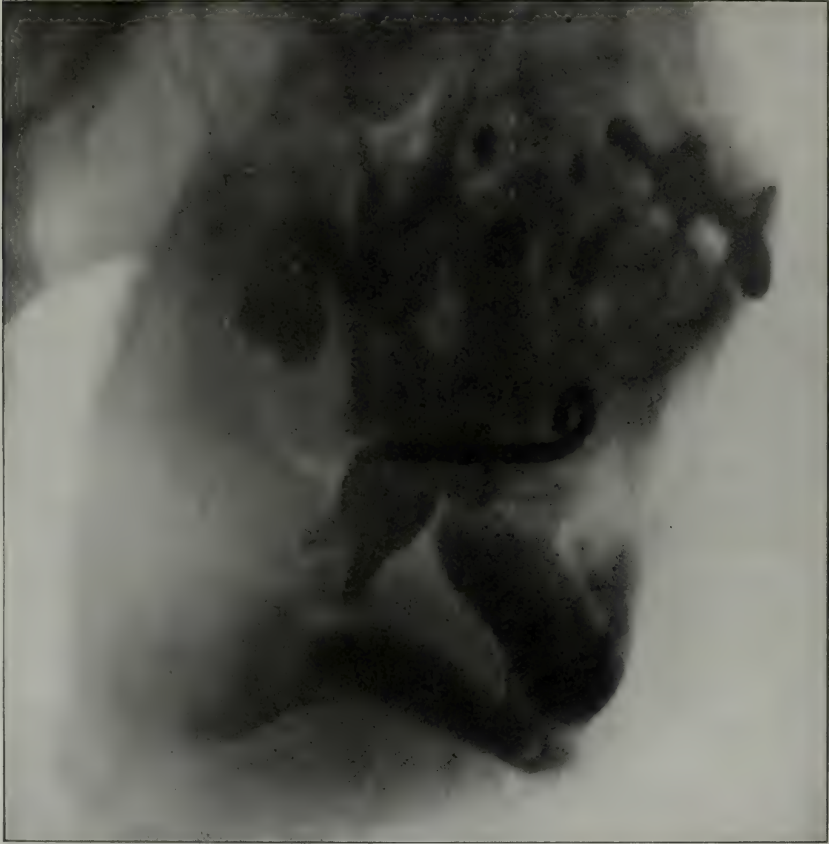
CASE I. Wounded May 30, 1918, by a high explosive shell, causing a compound comminuted fracture of the right mandible, destroying the lower left first molar and the bicuspid, alveolar process, and the bony substance. Teeth wired July 1st, wires removed August 3d. A lower splint was then constructed and

tient having removed it, and it was discovered that the posterior fragment had moved forward 1 cm. The teeth were in perfect occlusion and the bone defect was filling in rapidly. A gold bridge was constructed and cemented in place. Patient was put on a soft diet, and at date December 10th primary union was taking place, giving every indication of a successful, permanent result.

This to our mind is sufficient evidence of nature's attempt to close the gap in the mandibular arch. We therefore contend that the proper method to pursue in such cases is to follow nature, or in other words, pull the posterior fragment

right second molar. All teeth and alveolar process between these points were comminuted, leaving intact only the inferior border of the mandible, which was fractured at three points, viz, at the left angle, the left mental foramen, and

FIG. 12.



Shows case after insertion of bone-graft. (January 15, 1919.)

forward if the defect is not greater than 3 cm.

(See Fig. 7.)

CASE II. Wounded April 11, 1918. Shot by German sniper while on patrol. Rifle bullet entered the left mandible at the mental foramen, just grazing the lower left second bicuspid and making a groove in the root. It then crossed the mouth and passed out at the lower

about the region of the lower right first molar.

The day he was wounded the jaws were wired together, but a short time afterward the teeth which were wired became so loose that they had to be extracted. On June 10th a splint was cemented into place, including the lower right second molar and the first and second molar of the left man-

dible. This was in place until July 25th, when the lower right second molar became so loose and painful that it was necessary to remove the splint and extract the tooth. In so doing a large piece of bone was removed.

The patient arrived at this hospital September 8th. Fig. 8 shows a model which illustrates the position of the jaws at that time. There was no occlusion; a fibrous union was present at the left

decided that the prospects of a more stable union would be greatly improved if the posterior fragment on the right side were drawn forward, so as to more closely approximate the anterior one. To accomplish this, the first splint was removed and new impressions taken. The models were cut and reconstructed. A new splint with a pin-and-tube attachment, as shown in Fig. 9, was cemented into place October 30th. We

FIG. 13.

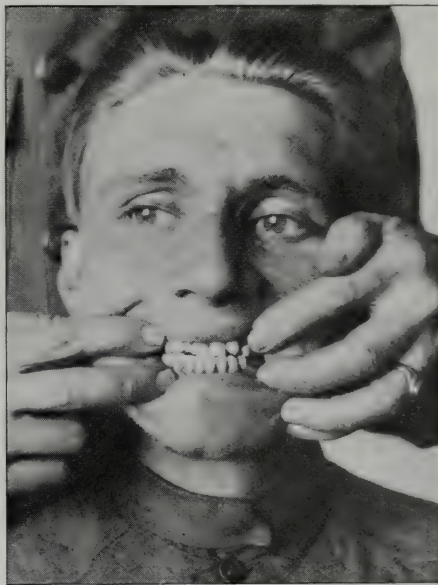


Shows destruction (March 10, 1919). Bone-graft has taken good firm union.

angle and the left mental foramen. There was a loss of bone on the right side of over 3 cm. The fragments were freely movable and tipped toward the median line. They could be forced into alignment by hand pressure.

A splint was constructed of the interdental type, made of cast aluminum. Due to the abnormal position of the fragments, the patient wore the splint a week before we attempted to cement it into place. September 20th it was cemented and the teeth put into normal occlusion. After further study of the case it was

FIG. 14.



Shows case with removable prosthesis in place.

thus reduced a gap of over 3 cm. to less than 2 cm. At the present writing the bone gap is filling in rapidly. It is interesting to note that this patient gained over twenty pounds on a liquid diet.

It was this case, together with several others, that proved to us the impracticability of a single splint for the lower jaw when the points of fixation are widely separated and when there is a large gap to bridge over with bone.

The patient returned December 20, 1918. Union was not complete on the

right side, so Major Brown made a tibia bone-graft, with good results. We have every reason at this date (February 1, 1919) to believe that the patient has a functional result assured.

March 1st the splints were removed. Bone union was found to be good and a removable prosthesis was inserted. (See Fig. 14.)

(See Figs. 8 to 14.)

FRACTURES AT THE SYMPHYSIS.

We have had twenty cases with comminution and loss of substance in the

FIG. 15.



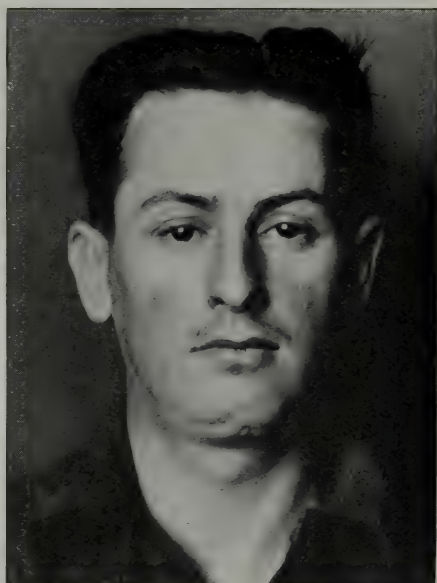
Note notch in lip, also absence of teeth.
(September 30, 1918.)

region of the symphysis, which is a most difficult condition to treat, the end result often being unsatisfactory even after firm union has apparently been obtained. The reason for this becomes evident when we consider the mechanics of the jaw. The lower maxilla consists of two levers the long arms of which form an arch by their union at the symphysis. The pull of the strongest muscles, *i.e.*

the direction of the applied force, is upward and inward. Therefore, when the keystone of the arch is weakened, as occurs in comminution at the symphysis, the two parts of the mandible will of course be drawn inward, thereby changing the contour of the chin and causing malocclusion.

Even after apparently firm union has been obtained, re-fracture is much more likely here than at any other part of the mandible. We received two cases from

FIG. 16.



Note perfect result in lip. (January 1, 1919.)

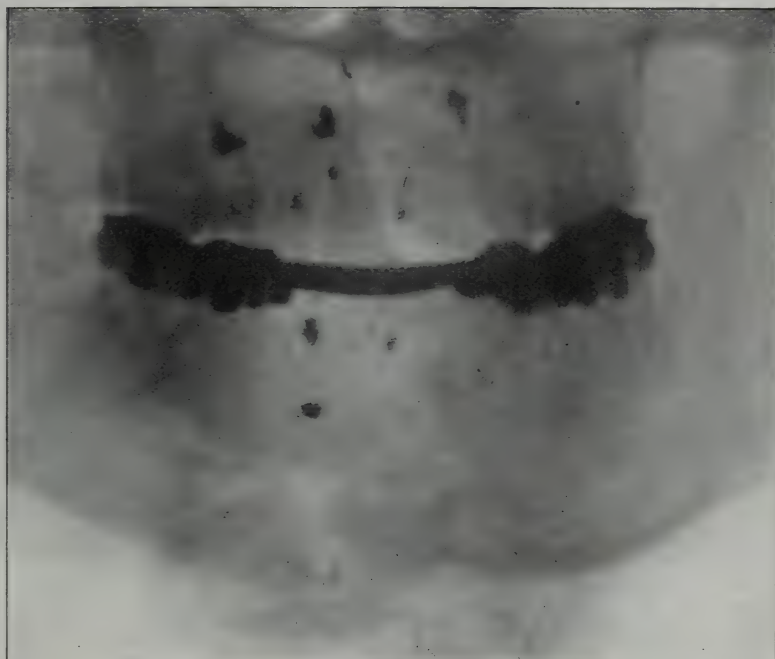
overseas in which re-fracture occurred on board the transport. In almost every case a certain amount of springiness exists at the seat of the fracture, and when the splints are removed this springiness allows the two parts of the mandible to be drawn inward, thereby causing malocclusion of the worst type—a drawing inward of but 1 to 2 mm. being sufficient to produce decided malocclusion. In all of our twenty cases there has been a tendency toward malocclusion on removing the splints. In nine of these cases it was necessary to force the two bones

apart in order to secure the proper occlusion. In the other eleven cases this procedure was rendered unnecessary by inserting fixed bridge work. We believe that wherever possible, after removal of the splints, all cases of compound comminuted fracture of the mandible should be given the support of fixed bridge work, and that the necessity of such support becomes more imperative as the fracture and loss of substance approaches

hands and entered the mandible at the symphysis and destroyed part of lower lip and lower incisors with their bony support. The jaws were wired together July 30, 1918. On August 15th a lower splint was applied, in France.

Arrived at U. S. A. Gen. Hosp. No. 11, Cape May, N. J., September 16, 1918. General prophylaxis was given in the dental department. The fetid odor was so great that it required officers to

FIG. 17.



Shows destruction of bone and teeth at symphysis. (September 25, 1918.) Splint in place.

the symphysis, the keystone of the mandibular arch. This bridge work not only gives support to the parts, but restores lost teeth as well. The use of such bridges has enabled us to discharge many of our cases from two to five months earlier than would otherwise have been advisable.

CASE III. Wounded by machine-gun bullet July 18, 1918. The patient had his rifle in position to fire, and the same bullet amputated the thumbs of both

alternate in cleansing the mouth. The sinus extending from the mouth through the chin was cleansed daily.

September 25, 1918, improvement showing, odor better; mouthwash was prescribed. September 30, 1918, improvement continues; gaining weight; odor disappearing; general physical improvement. October 15, 1918: Treated each day since last notation, and continues improved. Sinus healed.

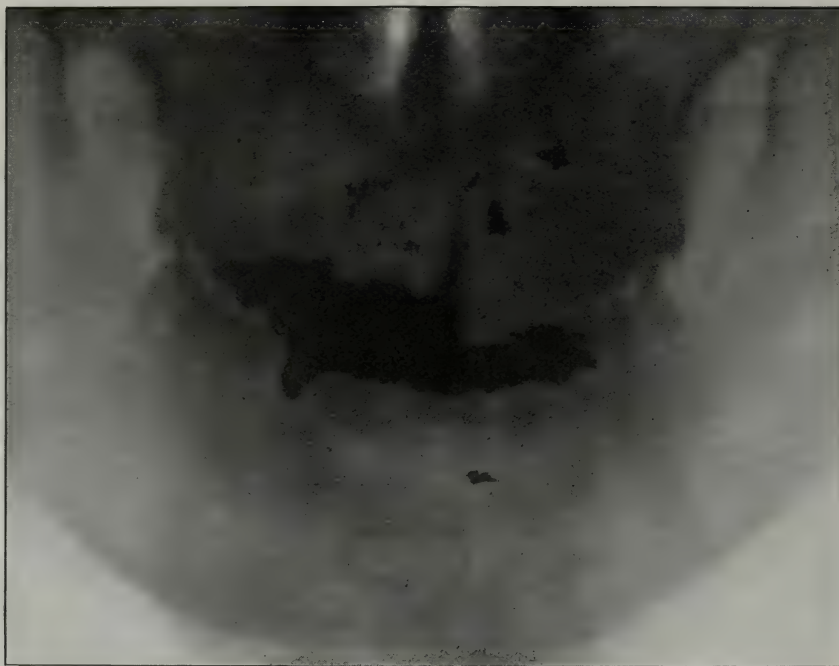
November 1, 1918, splint became

loosened. Impression taken for lower bridge to span fractured area. Has gained twelve pounds.

November 10, 1918, a gold bridge consisting of three gold crowns and five porcelain dummies was cemented in place. This was found necessary, as after removal of splint a springy condition was found in the line of fracture, medium line of mandible, and fragments

that we treated eleven cases of fracture of the maxilla and one hundred and eighty-two of the mandible. Although we have seen numerous wounds in the maxilla, it was only necessary to use splints in nine of these cases. In nine cases it was necessary to use Kingsley's splints or ordinary single splints to give strength. In the other two cases it was necessary to use considerable force to

FIG. 18.



Shows complete filling of bone. Permanent bridges in place. (December 15, 1918.)

moved slightly toward median line, tending to malocclusion.

Permanent bridges were found necessary in all fractures at the symphysis associated with loss of substance.

Major G. V. I. Brown restored the lip, December 15, 1918, with excellent results.

(See Figs. 15 to 18.)

FRACTURES OF THE MAXILLA.

In the treatment of fractures of the maxilla, it might be of interest to note

bring both segments to proper alignment and occlusion, but we were successful in both cases, one of which will be described in detail. These two cases were more difficult because both right and left maxillæ were fractured with loss of substance, depressed backward and partially united when they arrived here.

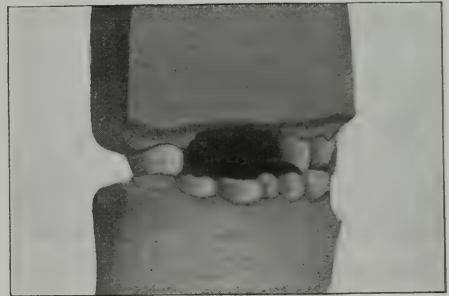
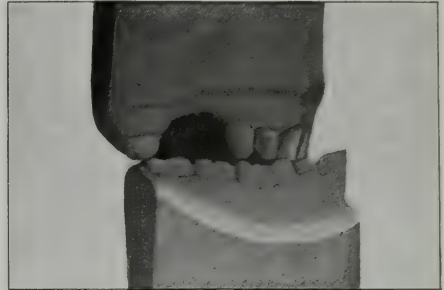
The greater frequency of fractures in the mandible is due, no doubt, to the greater resistance it offers to bullets.

CASE IV. Wounded May 28, 1918, by machine-gun bullet, entering right cheek in region of upper first molar,

passing across the roof of the mouth and through the left sigmoid notch, emerging 35 cm. anterior to external auditory meatus. Both upper right bicuspsids and the first and second molars were destroyed with all bone support. Both maxillæ were shattered, allowing the entire left maxilla to drop downward, backward, and to the right, 1 cm., with no occlusion. It was more or less

of the maxillæ. The maxillæ were depressed 1.5 cm. downward and backward.

FIGS. 20 AND 21.



These models show position of fragments before and after treatment.

This was a very difficult case, and before we used wires we tried rubber liga-

FIG. 22.



Shows appliance used. This is made in wax to illustrate. Note wires showing points where force was applied.

FIG. 19.



Shows profile. This case was taken a month after treatment was instituted, as we had no camera at that time. (October 15, 1918.)

fixed in this position when the case came into our hands. There was also an opening 9 mm. in circumference in the roof of the mouth which exposed the floors of the antra and the nose.

Patient arrived at this hospital September 9, 1918. His mouth was in bad condition, with foul pus exuding from wound in the roof of the mouth. He was wearing a removable vulcanite splint which had aided materially in preventing greater displacement of the fragments

tures for two weeks without success. As soon as the anterior fragment began to

move, one could see the opening in the roof of the mouth becoming larger,

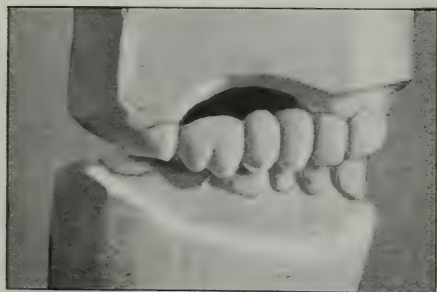
FIG. 23.



Shows improvement after seven weeks' treatment.

being at least twice as large as when we started, but rapidly filling. Fig. 19 shows resulting facial deformity. Treat-

FIG. 24.



Shows bridge in place and teeth in normal occlusion.

ment was immediately commenced to clean up the necrotic condition, and on September 27, 1918, splints were con-

FIG. 25.



Front view of patient. (January 31, 1919.)

FIG. 26.



Shows patient's profile a few days before discharge.

structed of the pin-and-tube type. These splints had in addition small lugs for the attachment of wires. After the splints had been cemented, the upper and lower were wired together, the wires being gradually tightened each day, the anterior fragment being thus drawn forward to its normal position. The posterior fragment containing upper third molar was held in position by a flange on the lower splint. This required eight weeks. The pin was then slipped through the tubes and the jaws held together to await a firm filling in of bone.

We have put an upper plate in place, and the patient is in fine condition. We covered the opening into the antra and nose with thin blotting paper during the taking of the plaster impression, which is an exceptionally good method to follow in taking impressions of this character. The plate was removed and a bridge inserted January 1, 1919, to permit Col. Blair to do a plastic closure of the defect in the palate, which operation was successful.

(See Figs. 19 to 26.)

(To be continued.)

Pain Following Local Anesthesia.

By D. N. LEWIS, D.D.S., Lake Forest, Ill.

(Read before the Dental Review Club, Chicago, January 21, 1919.)

THE statement "Prevention is better than cure" may be appropriately applied in connection with pain following local anesthesia. This subject is frequently rehearsed in books, in papers, in society discussions, and in private discourse—always with one important phase entirely left out. It is the purpose of this article to call special attention to this neglected or unrecognized phase of the subject.

It is agreed by all that in order to eliminate post-anesthetic pain every conceivable precaution must be exercised. The instruments, solution, operator's hands, area of injection, and site of operation must be made and kept sterile. The syringe and needle are made sterile, preferably by boiling immediately before using, and kept so by aseptic precautions throughout the operation. The solution must be newly made for each case from freshly distilled water which has been boiled in making the solution. Then the warm (not too hot, not too cold, but

blood-warm) isotonic solution is slowly injected. "Slowly" is a necessary precaution; if injected with much force or rapidly the patient will often blanch, the lips and forehead be suffused with a fine perspiration, a rapid pulse will develop, together with other signs of syncope.

The solution *must* be slowly injected; if not, the area about the point of the needle will be lacerated—torn apart—just to the extent that the tissues are made to "puff up" over the end of the needle. This wound is sufficient cause for subsequent soreness and pain. Slow injection permits the solution to be absorbed by the surrounding tissues as rapidly as it flows from the syringe.

The solution must be isotonic, or be approximately of the same saline consistence as the blood serum, in order that it may not cause compression or dilatation of the cells which it bathes and induce soreness or pain according as the solution may be hyper- or hypo-isotonic.

The solution should never be injected into a swollen or pus-soaked area. First, perhaps, because of the possibility of further distributing the infection; and second, because it does not produce the same profound anesthetic effect as is obtained in normal tissue.

Air should not be injected into the tissues. This is for reasons too obvious to mention. The air should always be entirely eliminated from the syringe before beginning the injection.

To emphasize: The solution must be fresh, sterile, warm, and isotonic; it must be slowly injected, and without bacterial contamination from the area of initial puncture, or any other source.

Alas for all the above precautions should the patient (operated upon or not) be sent out in the cold and the anesthetized area is allowed to become *chilled!* "not to catch cold"—while that is truly possible, and bad enough, it is not the point at all—but *thermal change* while under the influence of the anesthetic, while the synthetic suprarenin or the epinephrin is contracting the bloodvessels, retarding the circulation and preventing the area from receiving its normal proportion of warmth from the blood—that is the point!

Thermal reduction could be carried to the point of freezing. While it would be possible for this to occur without the patient's realizing it until the effect of the anesthetic began to disappear, yet it is not necessary for the temperature to reach the low, stony freezing-point for the patient to suffer agonies of pain when the effect of the anesthetic is gone.

After four years of careful observation it is confidently believed that the slightest chilling of the anesthetized area will bring about in some persons considerable discomfort as the anesthetic vanishes; while the firm conviction prevails that pain is almost invariably suffered by nearly all persons in proportion as the temperature is lowered during the period of anesthesia.

It requires the atmospheric temperature of a warm summer day, 70°F. or above, to prevent possible trouble. Trouble may occur on slightly chilly

days in summer, and increase with the cooler days of fall and spring, and become truly violent in the colder days of winter.

In consequence of the foregoing, it may be of value to note what aberrations are induced by injecting into a given area (toe, abdomen, or chin) a quantity of suprarenin plus anesthetic. In the first place, with the injection of suprarenin the circulation is diminished in that area while it remains practically normal in all other parts of the body. A perfectly logical conclusion is that the temperature in that area may be reduced toward that of the surrounding atmosphere in proportion as the drug shuts off the circulation, or the normal supply and distribution of warmth. If there is no anesthetic with the suprarenin the patient can feel the chill of the lowering temperature, and will recognize the sensation as that of cold.

In the second place, if anesthetic alone is injected the circulation will be only slightly affected, the temperature of the part will not be appreciably lowered, and the patient could not recognize the sensation of cold if the part were frozen.

Now the inference: Inject suprarenin plus anesthetic, and the area is rendered susceptible to chill or cold which the patient cannot feel; the more profound the combined chemical action the more susceptible to cold, and the less perceptible to the patient.

In conclusion, it is deemed imperative that all patients should be advised to keep the face protected and comfortably warm until the effect of the anesthetic is gone. Emphasize the instruction with the positive assurance that the affected side could freeze as hard as stone without their knowing it if they did not touch it with the hand or some other normal part of the body! Under strong emphasis the patient will be more likely to heed the instruction, and less likely to return with the report of terrible pains.

The gist of all this story is: Do not permit your anesthetized patients to go out and allow their faces to freeze; if they do, do not blame the anesthetic!

Litmus as an Indicator of the Salivary Reaction.

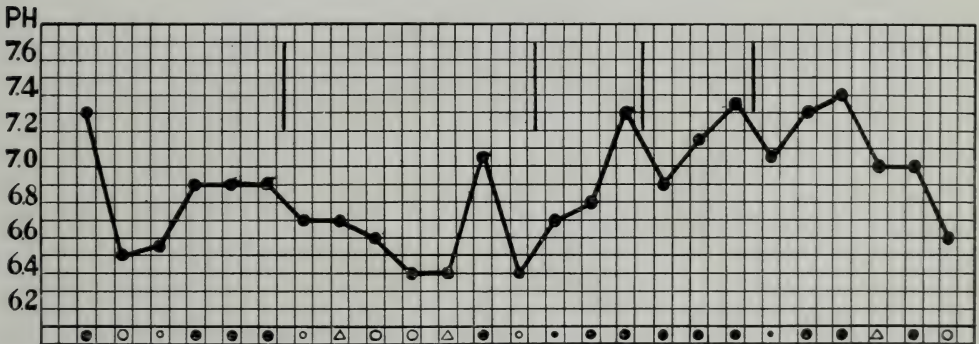
By L. W. GRAHAM, M.S., Philadelphia, Pa.

From the Laboratory of the Gladwyne Colony.

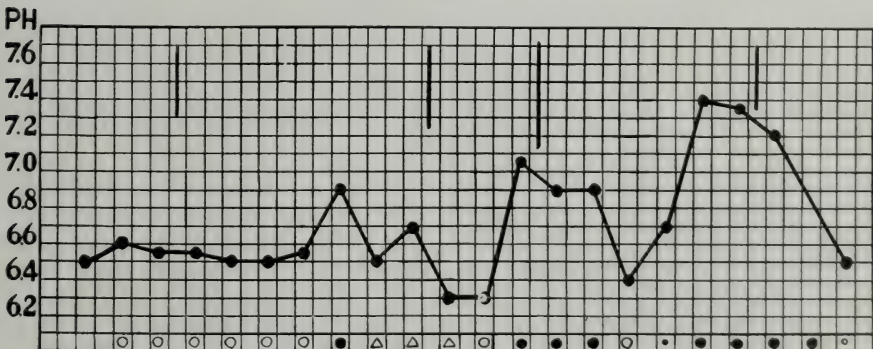
THE object of the following experiments was to ascertain the value of litmus as a test of the reaction of the oral fluid. Judging from results obtained by comparing the hydrogen ion concentration of mixed saliva with the reaction of litmus paper to saliva, litmus appears to be sufficiently accurate as a means of detecting acid and alkaline conditions of saliva beyond certain limits of hydrogen ion concentration.

The hydrogen ion determinations of mixed saliva were made as follows: 2 cc. of mixed saliva were collected in a bottle giving off no alkali (saliva being stimulated by paraffin). The saliva was then transferred to a collodion sac and dialyzed five minutes at room temperature against 0.8 per cent. sodium chlorid solution. The sac was removed from the dialyzing tube and 0.2 cc. of phenol-sulfo-naphthalein were added. The fluid

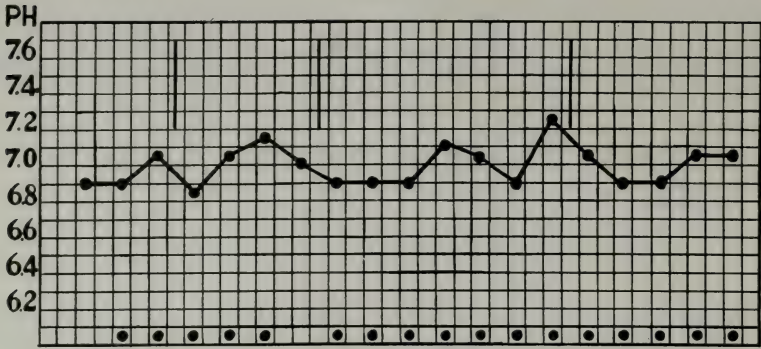
I.



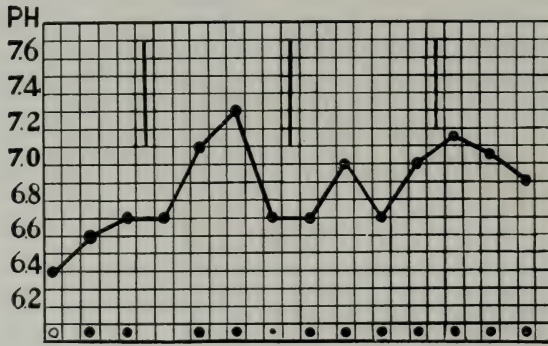
II.



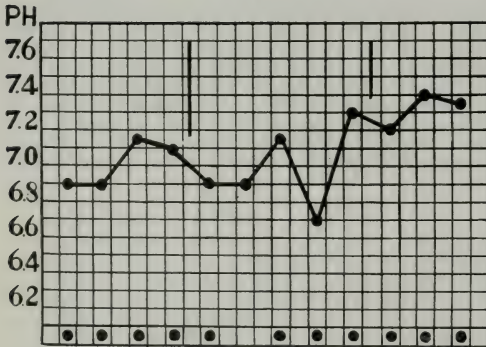
III.



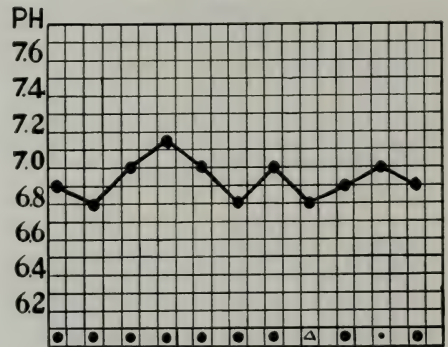
IV.



V.



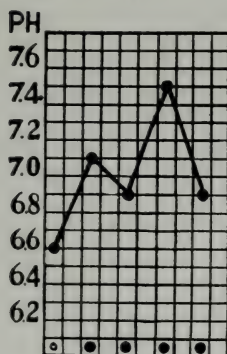
VI.



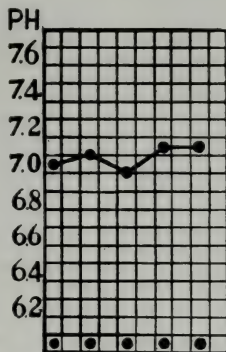
was then transferred to a hard glass test tube and its shade of color matched against color tubes of known hydrogen ion concentration (¹). The litmus reaction of the same specimen of saliva was noted just before the hydrogen ion test was made.

From the results of experiments carried out according to the above methods and represented in the accompanying charts, the PH of saliva may vary considerably in the same individual. The majority of alkaline litmus reactions are above PH 6.8; while a few are noted

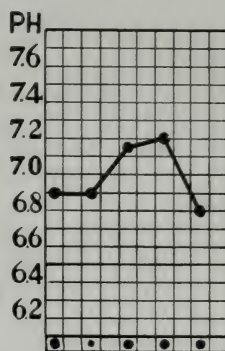
VII.



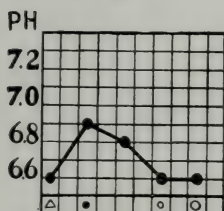
VIII.



IX.



X.



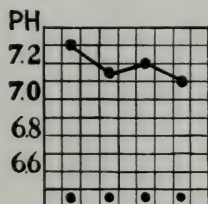
EXPLANATION OF CHARTS.

Each curve represents the PH of the saliva of a different individual. The vertical lines above the curve mark off the days, not consecutive, on which the saliva was tested.

At the foot of each curve, and beneath each PH reading as indicated on the chart a series of characters represents the reaction of the saliva to litmus, a reaction determined at about the same time as the overlying hydrogen ion concentration was measured. The characters indicating the litmus reaction are as follows:

- ▽ Neutral.
- Faintly acid.
- Distinctly acid.
- Faintly alkaline.
- Distinctly alkaline.

XI.



at concentrations between 6.6 and 6.7. Below PH 6.6 the saliva is acid to litmus, although in a few instances litmus is also neutral. Neutral reactions of litmus do not coincide with a constant PH, and hence are inaccurate as indicating a neutral condition of saliva. Below PH 6.6 and above PH 6.7 litmus paper showed acid and alkaline reactions. The neutral point of saliva may lie between these concentrations; but this was not demonstrated, owing to the variability of the neutral reaction to litmus. It seems probable that 6.6 and 6.7 are the limits of neutrality beyond which saliva reacts acid and alkaline to litmus. Thus it appears that in the case of sal-

ivary reactions litmus is much more delicate as an indicator than has been supposed. Further experimental work should decide this point more definitely.

It should be noted that the foregoing observations were made on saliva *in vitro*, and therefore do not represent the true reaction of the oral fluid as it occurs in the mouth. It was noticed in several instances that saliva acid to litmus in the mouth became distinctly alkaline on standing about five minutes—a change doubtless attributable to a transformation of acid to basic phosphates.

From the evidence presented by the curves of hydrogen ion concentration and the accompanying litmus reactions,

the conclusion appears to be legitimate that litmus is reliable for detecting hyperacidity and hyperalkalinity of saliva, notwithstanding that it is inaccurate as an indicator of neutrality and of faintly acid and alkaline conditions.

When more exact results than are possible with litmus are desired, the colorimeter method of Levy, Rowntree, and Marriott as described in modified form above may be employed. Both methods require hourly observations on successive days, if possible. Owing to a lack of time it was not possible to carry on the hydrogen ion tests of the present work over so long a period as was desired, but

the results as far as they go seem to be significant. The litmus test of saliva, when taken every hour during the day over a long period, is a much speedier test, and as far as the results of this work show appears to be sufficiently accurate for detecting hyperacidity and hyperalkalinity of saliva.

REFERENCES.

(1) LEVY, R. L., ROWNTREE, L. G., and MARRIOTT, W. McKIM. *Archives of Internal Medicine*, September 1915, xvi, pp. 389-405.

(2) LUDLUM, S. D. W. *Medical Clinics of North America*, November 1918, pp. 895-901.

CORRESPONDENCE

A Double-rooted Canine.

TO THE EDITOR OF THE DENTAL COSMOS:

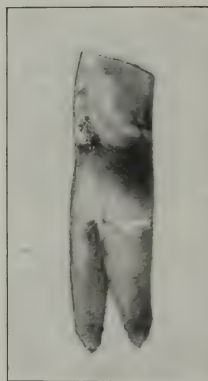
Sir,—I am sending to you herewith a lower left canine which I extracted this morning from the mouth of a lady patient fifty-five years of age. (See figure.)

You will note that the tooth has two distinct roots, and I am sending it for the reason that it may be of interest to your readers as a dental anomaly.

Very truly yours,

S. J. LEVY, D.D.S.

BROOKLYN, N. Y.



Checking of Gum Blocks.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Will you kindly permit the following question to be submitted to the readers of the DENTAL COSMOS?

When gum blocks are ground close, have good joints, and are packed well

with very small excess of rubber, why do some of the blocks check after vulcanizing?

Very truly yours,

H. B. SCHWARTZ.

BALTIMORE, MD.

“Dental Broach in the Bronchus.”

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Referring to the paper of Drs. Jackson and Spencer in the March issue of the DENTAL COSMOS: I have been using the S. S. W. contra-angle porte polisher as a holder for these small broaches. I have found that it gives the operator better control over the broach, and if always used would preclude the danger of such an occurrence as that reported by Drs. Jackson and Spencer.

I know of but few that are using the “polisher” as a broach-holder, but I feel that it should be more extensively used for this purpose, as it will eliminate the liability of such an accident as that which they report.

Very truly yours,

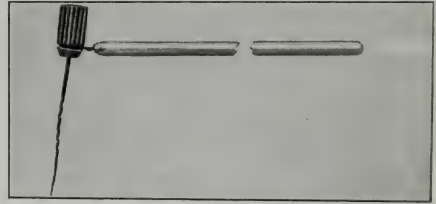
WM. H. MITCHELL.

BAYONNE, N. J.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Noting the report of a case of inspiration of a broach into the lung in the March issue of the DENTAL COS-

MOS, I am sending you the illustration of an instrument which I use in this connection. (See figure.)



The instrument is made from the discarded handle of a Young's X-fine smooth broach, the root-canal broach being attached to this with wire, as illustrated. This enables one to twist the reamer around in the canal, allowing the aluminum handle to lie across the mouth and avoiding any possibility of the reamer passing down the throat.

Very truly yours,

H. A. GRAHAM, D.D.S.

HARBOR SPRINGS, MICH.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDWARD C. KIRK, D.D.S., Sc.D., LL.D., *Editor.*

L. PIERCE ANTHONY, D.D.S., *Associate Editor.*

PUBLISHED BY THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Virgin Islands, Cuba, and Mexico. Canada, \$1.40. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the EDITOR, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, MAY 1919.

EDITORIAL DEPARTMENT

The Dental Lesson of the War.

AMONG the many results which the world conflict has wrought into the fabric of our civilization is its revelation of the potentialities and weaknesses of our social organization. In the stress of war and in the preparation for war we have discovered elements of strength previously unrecognized and likewise factors of weakness unsuspected. The business of war has in large degree revealed us to ourselves as we are, and in equal degree it has revised our notions of what we thought we were—which, to the extent that we profit by the experience, is wholesome and as it should be.

One of the lessons which the war has taught with the emphasis of convincing demonstration is the fundamental necessity for the

elimination of dental and oral disease as a factor of bodily ill health and physical inefficiency. Whether we consider the teeth merely as elements in the masticating mechanism whose loss interferes in a purely physical sense with the mastication of food, or whether we regard them as possible foci of infection from which pathogenic organisms and their toxins may originate disease in remote parts of the body and thus become a menace to general nutrition, in either event the war has shown conclusively that loss of the teeth or disorders of the teeth and oral tissues operate as factors of disability in the fighting units of the nation, quite as effectively and definitely as do the so-called major diseases—or, as a matter of fact, as do the casualties incident to war itself.

Army regulations, generally speaking, require that the recruit shall possess a specified minimum number of teeth regarded as sufficient to properly masticate his food. Possession of less than the specified number operates as a factor disqualifying for military service. When during the latter part of the war the man power of France was seriously depleted, over two hundred and fifty thousand effectives were mustered into the French service as the result of efforts instituted by Dr. Georges Villain of Paris, by which that number of men who had been rejected for lack of teeth but who were otherwise physically sound were outfitted with artificial dentures and sent to the fighting line. The incident is almost dramatic as demonstrating the vital importance of sound teeth to the soldier, and it now needs no stretch of imagination to realize the importance of the soldier to the nation.

But loss of the teeth is only a minor aspect of the subject. Absence of teeth is in itself a cause of disability in the fighting man, but lack of teeth is the terminal result of a long series of dental disease conditions beginning in childhood, any or all of which are a cause of physical disability more or less serious and all of them important because of their potentialities for damage to the general health. These facts, while more or less trite to the dental profession as a whole, have been disregarded or ignored for years by the medical profession and the lay public. The experiences of the war have brought them into a position of commanding prominence, so that the problem of dealing effectively with dental disease is now receiving more earnest consideration by health authorities, by physicians, and by the general public than

at any other period in the world's history. It is a matter of national pride to us that ample provision was made by the United States Government for the dental care of the military forces engaged in the European war. Considering the magnitude of the undertaking, the creation of a Dental Surgeons Corps with a *personnel* approximating ten thousand, with their complicated equipment, was practical evidence of the appreciation by the Administration of the value of dental service as a safeguard to the efficiency of its fighting forces. No other nation has so amply or so effectively provided for the dental care of its armies.

Both France and England fell far short of actual requirements in providing for their military dental service, and the demonstration of the magnitude and importance of the need for adequate dental service as a factor of national defense has become a problem of national concern in both of those countries. It has, moreover, become clear that sound teeth in the adult can only be secured by proper dental care and treatment begun in childhood and continued throughout the whole period of growth and development. If, as is now conceded, the soldier must have passably sound teeth and healthy oral tissues, then his dental care must begin in the kindergarten—which raises the question of oral hygiene in the public schools to a position of fundamental importance.

These two problems, the teeth of the soldier and oral hygiene for children of school age, became acutely prominent as an experience of the war in connection with the large number of disabilities from dental disorders among the men. So manifest was the need for organized and intelligent handling of the situation that a Royal Commission was created in Great Britain about a year ago to examine into and report upon, among other things, "The causes of the present inadequate supply of qualified dentists and dental surgeons," and making certain suggestions for their increase and the protection of the British public against dental practice by unqualified and incompetent persons.

The report of the Commission which has just been issued constitutes a remarkable exhibit of the woful lack of means whereby the British public may secure proper and necessary dental care. It is estimated that about 5000 dentists in Great Britain are legally qualified for practice; in addition it is estimated that at least 12,000 unqualified persons are practicing or professing to practice

dentistry. The population of Great Britain is in round numbers 40,000,000, and—making the very liberal estimate that by the 5000 qualified dentists' devoting two hours per year to each patient and working ten hours a day for 300 days a year, it would be possible for them to treat 7,500,000 patients annually—it would leave 31,000,000 patients to the tender mercies of the 12,000 unqualified dentists, or otherwise without any dental treatment or care whatever.*

To meet the need for an adequate public dental service, plans are now forming as the result of recommendations of the Royal Commission for the creation of public dental clinics for public school hygiene, so that the 6,000,000 children in the British elementary schools may have effective dental care and supervision, and for the reorganization of the dental profession whereby the total number of qualified dentists shall be made adequate to the public need. These important objectives will undoubtedly be attained through legislative action and Government support as soon as full consideration shall determine the best means to be employed, to which end Parliamentary sanction is already assured.

The striking feature of the present situation in Great Britain with respect to dentistry in its public health relations is that the Government has shown itself to be fully alive to the serious importance of the dental problem, and has dealt with it as one of the elemental factors in the general problem of public health conservation. We have therefore in the action of the British Government what we believe to be the first instance in which the specific consideration of dental and oral hygiene as a national public health question has been officially dealt with. The same agencies which have made dentistry a problem of the national health are actively at work in France, and we may confidently expect that analogous considerations will promote similar action elsewhere. We have at various times directed attention to the fallacy that dentistry—in the sense that dentistry means, as it should mean, the kind of professional service that makes for sound teeth in a healthy mouth—is a luxury only within the means of the well-to-do portion of the population.

* These figures are furnished by Mr. Percy Millican, L.D.S., in the *British Dental Journal*, February 15, 1919.

Dentistry as a health measure must be brought within the reach of all the people, just as skilled medical and surgical service is accessible to all. The impulse in that direction is worldwide and irresistible. The state will be required to do its part, but the dental profession must furnish the skill and training and solve the problem of creating a technique that has for its object public health rather than private gain.

The Victory Liberty Loan.

IN our April issue we published an appeal to the dental profession from the Victory Liberty Loan Committee, made on the basis of our obligation to the Government as a profession.

We present herewith a second appeal from the Committee, based on the larger obligation of national citizenship. This is an opportunity for the dental profession to demonstrate in a substantial manner its loyalty to the Government not only as a profession, but as citizens vitally interested in the welfare of our Government and of humanity at large.

From the Victory Liberty Loan Committee

IF every citizen of the United States subscribed for his just share of the Victory Liberty Loan, this six-billion-dollar issue of Government short-term securities could be snapped up in half a day. The campaign for the sale of the issue opens on April 21st, and three weeks is allowed for it by the Government.

Time is important only because of the necessity for wide distribution. This has always been an advantage to the Government, to business, and to workers alike. But in the coming campaign it is essential that the loan be distributed as evenly as possible over the entire nation. Otherwise, even though it be oversubscribed, it will fall short of some of its objectives.

The most important of these is the stabilization of industry. Call it reconstruction or adjustment or anything else, the task finally stands clear as that of dispensing with the costly forced draft of war speed, and restoring the private business of the United States to a normal, peace-time basis governed by supply and demand. And,

according to all the financial experts of the country, this cannot be done unless every citizen takes his full share of the new issue.

That is why every worker for the Victory Liberty Loan is having it impressed upon him that the smallest subscription counts, and counts big. That is why the Government War Loan organization has set out to exceed the mark of 31,000,000 individual subscribers reached in the sale of the Fourth Liberty Loan.

Six billion dollars' worth of securities concentrated in any one section or sold to any one class, or group of classes, means inevitably a slowing-up of business. It means "tight money" at the banks. It means difficulty for the manufacturer in getting raw material, changing his machinery used on war production, and resuming business in the old way.

But six billion dollars equally distributed is literally not more than a "drop in the bucket" to the whole nation. The best evidence of this can be found in the records of bank deposits, showing a total of over thirty-one billion dollars. These, of course, do not begin to represent the wealth of the nation. They are only representative of the medium of exchange—and only part of that.

Each individual subscription obtained spreads the burden. If the Victory Loan can be equally distributed there will be no reason why it should be a burden on any individual or any class.

THE COMMITTEE.

REVIEW OF CURRENT DENTAL LITERATURE

[*Proceedings of the Royal Society of Medicine*,
Sect. Laryngology, London, December 1918.]

Absorption of Premaxilla in Tertiary Syphilis of Nose. BY DAN MCKENZIE.

The patient was a man. Two or three months before presentation the gums about the maxillary incisors began to shrink, the teeth loosened, and were exfoliated. The shrinking continued until there was no gum left. Upon examination, the alveolar process and the whole of the anterior arch of the palatal processes of the superior maxilla were found considerably reduced in size. The mucosa and submucosa of the gums were thrown into ridges and folds through the shrinking of the underlying bone. No ulceration was

seen in this part of the mouth, but high up in the gingivo-labial recess in the left canine fossa there was a definite firm infiltration with a fissure running through it. The incisors of the mandible project beyond the shrunken upper jaw by about one inch. The upper lip has fallen in, giving the patient's face an unsightly, underhung appearance.

The nose was the seat of active tertiary syphilis. Presumably, the absorption of bone in the premaxillary region was due to the destruction of the naso-palatine nerve, and also perhaps of the dental branches of the superior maxillary nerve, from involvement in the extensive infiltration.

In discussion W. Hill mentioned two similar cases—the first a case of congenital syph-

ilis, and the other of syphilis in a boy, age sixteen years. Richardson (*Annals of Otolaryngology, Rhinology, and Laryngology*, St. Louis, June 1918, p. 605) gives the history of a similar case. See also *New York Medical Journal*, January 4, 1919, p. 39.

[*Journal of the American Medical Association*, December 7, 1918.]

Three Signs of Some Value in the Diagnosis of Unusual Cases of Influenza.

By THOMAS F. REILLY.

The sign that is of dental interest is given as follows: In a large number of true cases of influenza of the respiratory tract, Reilly has noticed a sign that may at times be of some help from a diagnostic standpoint. It consists of a very marked redness of the opening of Steno's duct, just opposite the second molar tooth. The punctum is usually swollen and raised above the level of the cheek, and the red spot is seen in the center. Mere swelling of the punctum has no diagnostic import. It may easily be inspected by placing a spoon-handle in the side of the mouth and retracting it. If the sign be present on one side it is almost always visible on the other as well. It is not invariably present, but can be seen in at least seventy per cent. of the cases. It has been present in most of the sporadic cases, and here is of very considerable value.

J. Maxey Dell (*Journ. A. M. A.*, March 15, 1919, p. 817, in a letter refers to two cases confirmatory of Reilly's observations. In both cases there was a typical lobar pneumonia temperature, and the crisis was reached on the ninth day. The interesting point about the two cases was the occurrence of a parotitis, which appeared with the crisis. One case developed overnight, and the swelling was as pronounced as in that of a case of specific parotitis. Both patients suffered intense pain for the first twenty-four hours.

[*Medical Record*, New York City, December 28, 1918.]

Parotitis as a Complication of Influenza.

By DAVID I. MACHT.

An inflammation of the parotid gland as a complication or sequel of influenza is of extremely rare occurrence. Macht reports a single case, that of a white male of twenty-four years. The influenza was very severe;

temperature of 104°F. In a few days a broncho-pneumonia set in, lasting two weeks, and principally limited to the right lung. At the beginning of the third week there was a sudden pain in the right parotid region, with definite swelling. The parotitis did not develop on the left side. The swelling increased and became aggravated, requiring opiates; fever 100° to 101°F. No abscess developed. The condition persisted without softening of the gland for two weeks; then gradual subsidence, but a definite swelling and hardness was noted as late as three weeks after the onset of the complication. Eventually recovery was complete.

[*Bulletin et Mémoires de Société Chirurgie de Paris*, October 22, 1918.]

Lingual Decortication for Leukoplakia under Local Anesthesia.

By L. CHEVRIER.

The case is interesting on account of two peculiarities: (1) The area of mucosa removed included not only part of the dorsum but also the sides and part of the inferior aspect of the tongue. (2) The decortication was performed under regional anesthesia of the tongue—mucous injection in the middle of the linguo-gingival furrow at the level of the third molar, on the right and left sides. In a few minutes total analgesia of the anterior two-thirds of the tongue results.

[*Gazzetta degli Ospedali e delle Cliniche*, Milan, January 10, 1918.]

Trophic Lesions of the Face.

By G. TALANO.

Three cases are here reported, two of atrophy, and one of hypertrophy.

Case 1, a woman of forty-two years. She dated the condition sequent to a "congestion" about eight years previously. There were sensory disturbances. The left side of the face was visibly reduced in volume, paler; masseteric region presented a slight concavity. On laughing or speaking the buccal orifice was deviated toward the affected side (cf. similar peculiarity in a case of Testut and Marchand's—see abstract following). Thyroid gland and adrenalin administration brought some amelioration.

Case 2, woman of sixty years, presented bilateral luxation of mandible; deformity of ascending ramus and articulating condyles (hypertrophy of coronoid process and atrophy

of condyle). Mandibular teeth devoid of gum, elongated; molars very loose.

Case 3, man of fifty-two years, presented a complete hemiparesis, dating back three years from a cerebral hemorrhage. The mandible protruded markedly, advancing the inferior dental arch 1.5 cm. beyond the line of the superior dental arch. The chin was sharply pointed. The condyles had diminished in volume. Elsewhere, Talano speaks of this case as a "hypertrophic dystrophy of the mandible."

The etiology of these conditions is very obscure. The available literature was consulted. In conclusion Talano decides that (1) the dystrophic forms of the face are a result of a trigeminal neuritis; and (2) the cause of the neuritis is syphilis or a mechanical irritation. * The three cases above each gave a positive Wassermann. Possibly the syphilitic virus acts on the trophic center of the fifth nerve. It is not impossible that the case (below) of Testut and Marchand's belongs to this category, in which instance the trigeminal neuritis was definitely associated with the meningococcus of Weichselbaum.

[*Presse Médicale*, Paris, January 27, 1919.]

Trigeminal Paralysis. BY L. TESTUT AND L. MARCHAND.

The authors report a case, a male of twenty-four years. In July of 1915 he was affected with cerebro-spinal meningitis. After the disappearance of the acute symptoms there occurred a progressive paralysis on the right side of the muscles of mastication and an anesthesia of the right trigeminal region. These troubles attained their maximum eleven months after the onset of the meningitis. The initial painful sensations, the establishment of a partial degeneration of the right temporal and masseter muscles, and the progressive amelioration of the affection seem to indicate that the condition was due to a trigeminal neuritis.

The patient presented clinically the classical symptoms of this paralysis: (1) cutaneous anesthesia, sharply delimited posteriorly by the cutaneous territories of the cervical plexus and the great suboccipital nerve; anesthesia of lips, gums, teeth, palatine vault, nasal fossa, eyeball, dorsum of tongue, on right side; abolition of gustation in anterior two-thirds of lingual mucosa on the right

side; (2) atrophy of right temporal and masseter muscles; and (3) vaso-motor disturbances on the right side of the face (these were not marked in this case).

The authors emphasize a particularly interesting fact, hitherto not signalized—the oval, oblique deformation which the buccal orifice presents when the mandible is lowered, a deformation which immediately recalls the position of the mouth in facial paralysis. From this latter condition, however, it is easily differentiated in that in facial paralysis the deviation is toward the healthy side, while in unilateral trigeminal paralysis the deviation is toward the affected side.

[*Bulletin de l'Académie de Médecine*, Paris, January 14, 1919.]

Daily Hygiene of the Mouth: Its Prophylactic Importance During Epidemics. BY PIERRE ROBIN.

[*Journal of Experimental Medicine*, Baltimore, March 1919.]

Occurrence of *Bacillus Influenzæ* in Throats and Saliva. BY IDA W. PRICHETT AND ERNEST G. STILLMAN.

A Study of Atypical Type II Pneumococci. BY ERNEST G. STILLMAN.

[*Journal of Infectious Diseases*, Chicago, April 1919.]

Hemolytic Streptococci in the Faucial Tonsil and Their Significance as Secondary Invaders. BY I. PILOT AND D. J. DAVIS.

Robin calls attention to a number of considerations: (1) The virulence of microorganisms may be enhanced in uncared-for mouths; (2) a dirty mouth is a danger to others; and (3) it is a danger to the patient himself (reinfection or secondary infection: it is to such conditions that are to be ascribed the infectious origin of the complications of influenza which have proved so fatal). The content of the three other articles whose titles are given above may be regarded as a demonstration of the reality of this danger.

Robin emphasizes the fact that the efficient cleansing of the mouth must be solely a mechanical process, and warns against "antiseptic" dentifrices. He prescribes a daily course of oral hygiene—brushing the teeth on rising, after each meal, before retiring (this latter is the most important), and

cleansing the interdental spaces, and rinsing the mouth or gargling after each such performance. For this latter purpose he suggests Ringer's solution: NaCl 0.7 p. c., KCl 0.03 p. c., CaCl_2 0.025 p. c., in distilled water.

This oral care, especially during epidemics, is to be taken both by patients and by those who are still in health.

Pritchett and Stillman report data obtained during an investigation of the bacteriology of influenza, which included the incidence of *B. influenzae* in uncomplicated and complicated cases of influenza and the associated types of pneumococci, the occurrence of *B. influenzae* in convalescents, and the occurrence of this organism in the mouth secretions or throats of normal people. The *B. influenzae* was cultivated from the mouth of 93 per cent. of cases of influenza and bronchopneumonia. It was present in the mouths of 43 per cent. of normal individuals. The types of pneumococci found associated with the complicating broncho-pneumonias of influenza are the types which are usually found in normal mouths.

Stillman studied 204 strains of pneumococci, all of which showed atypical agglutination in type II serum. Of these strains 100 were obtained from normal mouths. In classifying these strains agglutination and absorption reactions were employed. On the basis of specific agglutination in monovalent rabbit sera, the 204 strains were classified into 12 distinct groups (IIa to IIm). These subgroups have an incidence of 11 per cent. in lobar pneumonia and of 18 per cent. in normal mouths. Certain groups (IIb, IIc, IIf, and IIm) occur in normal mouths. Subgroups IIa and IIh, are met with largely in connection with disease.

In the work of Pilot and Davis, a study was made of swab cultures of the pharynx and tonsillar surfaces just before extirpation, and from the crypts of the excised tonsils from the same individuals immediately after extirpation, with particular reference to the frequency and predominance of the hemolytic strains. There were 100 patients, chiefly children, five to sixteen years of age. The tonsils probably represented a closer approach to the normal than any other type of tonsil for which enucleation is indicated. Hemolytic streptococci are common in the normal and diseased throat. The chief foci

of these organisms are the crypts of the tonsils. Hemolytic streptococci were recovered by swab cultures in sparse numbers from pharynx and tonsillar surfaces in 61 per cent. of throats, chiefly children with hyperplastic tonsils; and from the crypts of the excised tonsils of the same individuals were recovered in 97 per cent., usually in predominant numbers. Swab cultures are therefore unreliable in determining the incidence of this organism in the respiratory tract. The frequency of hemolytic streptococci is decidedly less in the throats of persons whose tonsils have been extirpated than in the throats of persons with normal tonsils. These streptococci agree in the main in their morphology, cultural characteristics, fermentation reactions, and pathogenicity for rabbits, and are practically identical with hemolytic streptococci isolated from various human pathologic sources. These organisms from the crypts of the tonsils are probably the most important source of the streptococcus complications of the various acute infectious diseases, and of the terminal infections.

[*Bulletin de l'Académie de Médecine*, Paris, January 21, 1919.]

A Peculiar Affection of the Maxillary Incisors. BY L. DUBREUIL-CHAMBARDET.

The author's observations have been continued over a period of twenty years. The peculiar condition to be described has been encountered in forty individuals. In adolescents of either sex, at about fourteen years of age, the condition manifests itself as a simultaneous caries of the four maxillary incisors. This caries is dry, and develops quite rapidly, terminating in four or five years in the loss of this dental group. In eighty per cent. of the cases there was noted a very accentuated ogival type of palatine arch. Two of the patients had hare-lip.

In the study of 1200 skulls, failure of the premaxillæ to fuse with the maxillæ was noted nine times. Of these nine cases, six showed the carious condition of the maxillary incisors above referred to. The author believes that this incidence indicates that the persistence of the premaxillary bone as an independent structure is a predisposing cause to this peculiar condition, in that it favors a status of lessened resistance. Concomitant with this persistence of the premaxilla is the

persistence of an infantile type of arterial supply to the four maxillary incisors. The resulting deficient nutritive supply is really the immediate predisposing cause permitting the carious process to occur.

[*Journal of Bacteriology*, Baltimore, January 1919.]

Bacterial Flora of Mouth and Nose of Normal Horses. BY E. H. BOYER.

The isolations were carried out on ordinary nutrient agar and, apparently, exclusively under aerobic conditions. The results of these observations are (1) that the nose and mouth of the normal horse harbor a large flora of micro-organisms (41 species identified, and 12 unidentified); (2) the great majority of these organisms are harmless saprophytes; and (3) occasionally there are present a few bacteria which may become pathogenic under certain conditions, viz, *B. coli*, *Ps. pyocyanea*, *M. citreus*, *M. pyogenes albus*, *M. tetragenus*, *Staphylococcus epidermidis albus*, and *Streptococcus pyogenes*).

[*Dental Items of Interest*, March 1919.]

A Contribution to the Study of Human Enamel, with Special Reference to Its Nutrition. BY JOHN S. MARSHALL.

The chief novelty of this report is a method of staining *in vacuo*. Fresh teeth which had not been allowed to dry were prepared as follows: The largest apical foramen was enlarged to receive an ordinary brass pin. The pins were inserted in the enlarged foramen and cemented in place with hot paraffin, care being taken to seal all other foramina with the same substance. The teeth are then to be dried with Japanese bibulous paper, special care being taken with the fissures, and then dipped in hot paraffin three different times, waiting for the paraffin to cool each time. This precaution was taken to prevent the entrance of stains into any invisible imperfections in the enamel or circulatory canals (?) that might be present in the cementum. Hot paraffin was now poured into glass dishes 1.5 inches in diameter and 2 inches deep, and while still hot the teeth were embedded in an upright position, crown down, and completely covering the apex of the root up to the brass pin. The paraffin was chilled as rapidly as possible by placing the dishes in cold water, in which they re-

mained overnight. The pins were then removed and the jars filled with the staining solutions in question. These jars were placed in a vacuum apparatus, the air being slowly exhausted. This was continued till the mercury registered 15 mm. The jars were allowed to remain under the bell jar overnight. In the morning the mercury registered 55 mm. Air was slowly allowed access to the bell jar, and the dyes poured off. The teeth were ground by machine into sections about 10 to 12 micra thick.

Marshall concludes that this method is superior to all other methods for studying the minute structures of the dentin and enamel. His attention was particularly directed to the "cul-de-sacs" or enamel spindles. The penetration of the stains to these structures, with the *in vacuo* method, is sufficient proof to the author that these structures are connected with the dentinal tubuli.

The primary motive of this study was to examine the question of the "metabolism of the enamel." Marshall is inclined to challenge the ordinary orthodox answer to that question, and to admit that some such process occurs.

In recent years some attention has been given to this problem, and the method of approach has been in general somewhat analogous to that followed by Marshall.

Among those who admit the possibility of a metabolic process or osmotic interchange of some nature in the enamel are T. von Beust (*DENTAL COSMOS*, June 1912 and Feb. 1914), Feiler (*D. Monatsschr. f. Zahnk.*, Sept. 1913), Gottlieb (*Ibid.*, Jan. 1914), Tileston (*DENTAL COSMOS*, Jan. 1914—by inference from clinical data), and Adloff (*D. M. f. Z.*, March and June 1914).

Pickerill (*DENTAL COSMOS*, Oct. 1913), Kantorowicz (*D. M. f. Z.*, Dec. 1913), and Walkhoff (*Ibid.*, Jan. 1914), interpret their data as a denial of the possibility of such process.

[*New York Medical Journal*, March 8 and 15, 1919.]

The Rôle of Focal Infections in the Psychoses. BY HENRY A. COTTON.

That oral diseases and abnormalities have on occasion played a rôle in the etiology of nervous, mental, and psychic disturbances has long been recognized. In recent years.

Upson has emphasized the frequency and seriousness of nervous reflex irritation arising from diseases, malpositions, impactions, and malocclusions of the teeth. The title of Cotton's paper recalls the subject of Upson's work, although no reference is made thereto, and certain of the cases cited by Cotton resemble clinically a type to be found in Upson's studies. However, the viewpoints from which these two authors approached the problem are quite different. Upson wished to exclude cases in which an infectious process was at work, while Cotton is concerned solely with conditions traceable to an infectious focus.

Incidentally to the central thought of Cotton's paper, mention must be made of his use of the complement-fixation reaction as a means of recognizing the existence of oral infectious foci. (Compare DENTAL COSMOS: Potter, McNeil, and Bradbury, May 1918, and Steinbugler, February 1919, p. 181).

Eleven case histories, to illustrate Cotton's views, experiences, and deductions, are given. They represent three very distinct types of manic depressive insanity. In the first group are placed four cases of severe manic type. The second group comprises three cases of a mild hypomanic condition in which the patients recovered rapidly under treatment. The third group consists of three cases of profound depression. Among his conclusions those pertinent to dentistry follow:

(1) Chronic, masked, or focal infections play a very important rôle in the etiology of the psychoses. (2) The origin of most chronic streptococcal infections is in alveolar or apical abscesses. (3) The organisms concerned in this infection spread from the teeth to other regions, notably the tonsils, stomach, duodenum, and lower intestinal tract, and these infections persist after the teeth have been extracted. (6) Infected teeth are due to a large extent to (a) faulty dental work, such as gold crowns; (b) habitual neglect of the teeth, and (c) by contact with parents, family, and friends, by kissing, use of common articles and eating-utensils. (8) Prophylaxis in mental diseases should include the education of physicians and the public in regard to the danger and menace to both physical and mental health of infected teeth, and the difficulty in locating such teeth without a complete roentgenographic examination by a man capable of interpreting the films

or plates when taken. (9) Dentists should be brought to realize the damage they are daily doing by faulty dental work.

An analysis of the case histories offered in this contribution does not support the emphatic incrimination of the teeth and of dental procedures expressed in the above conclusions. The four patients of the first group died. In only two of them is there reference to oral conditions. The whole condition of case 2 is ascribed *apparently* to a streptococcal infection *probably* originating in an alveolar abscess, but this deduction is purely inferential. Case 4 is described as having "teeth *apparently* good, but considerable bridge work and many teeth capped." In the second group, reference is made to the oral conditions in two of the three patients. Case 5 showed a rapid disappearance of the manic symptoms after the extraction of some teeth showing apical infection, which fact is decidedly in favor of Cotton's thesis. However, case 6 recovered from his mental attack without the removal of the oral infection. In the third group, two of the three cases exhibited a dental phase in the history of their condition. Both of these cases are strongly corroboratory of Cotton's views.

In summary, out of the 11 cases only 3 show a close correlation between the oral and the mental condition. There is undoubtedly great value in the doctrine of focal infections in illuminating otherwise obscure conditions, and oral foci are at least as important as foci elsewhere in the body; but to establish the thesis proposed by Cotton requires more rigid evidence than has been presented in this paper.

[*Annals of Surgery*, Philadelphia, February 1919.]

Post-operative Parotitis. BY JOHN B. DEAVER.

The type of operation, *i.e.* the organ or organs operated upon, plays a minor rôle in the phenomenon of post-operative parotitis. The cases occurring in Deaver's experience may be reasonably attributed either to peculiarities of the pathology encountered, to local conditions, or to post-operative wound infection. The cases of this condition may be classed into three groups—metastatic, occurring only in pyemic conditions; ascending parotitis, sequent to an ascending infection

via the excretory ducts, and traumatic, the result either of direct pressure on the gland or the forcible manipulation of the mandible by the anesthetist during the operation.

Appropos of the second group, that of the cases of ascending parotitis, Deaver states that while today the asepsis of the mouth receives considerable attention before and after operation, and thus this danger may lose some of its former urgency, the fact remains that infection *can* take place by this route. (Cf. *infra* Collins.) It is interesting to note that in recent times the majority of cases of secondary parotitis have occurred after severely infected conditions—appendicitis, peritonitis, perforating ulcer, etc.

Sometimes the dryness of the mouth following anesthesia is given as a contributory factor in post-operative parotitis. This might apply to the cases in which the complication occurs a day or two after the operation, but these are comparatively few, most of them taking place between the third and seventh post-operative days. On the other hand, the withdrawal of food by mouth and the resulting absence of oral secretions has also been assigned as a cause for the phenomenon. Indeed, a number of cases of parotitis are reported to occur during the starvation treatment in operated cases of (supposed) gastric ulcer. These cases might lend support to the theory of the bactericidal action of mucin. There seems little doubt, however, that interference with normal salivary secretion and with the protective action of the saliva as it drains down the ducts may be responsible for infection in such instances.

[*Surgery, Gynecology, and Obstetrics*,
Chicago, April 1919.]

Parotitis as a Post-operative Complication. BY CLIFFORD U. COLLINS.

The records available in 6100 patients showed that seven had developed parotitis, and that one patient developed parotitis and died while waiting for operation. Five of these eight patients died. An analysis of the factors determining this infection was undertaken. As a result, since 1915 only two cases of parotitis, both post-operative, have occurred, and neither of them died.

The conclusions reached follow:

(1) Post-operative parotitis is more apt to

occur after abdominal operations than after operations on any other part of the body.

(2) Its development is favored by a dry condition of the mouth and a lack of fluids in the body.

(3) The infection usually ascends through Stenson's duct.

(4) In patients whose abdominal condition makes it necessary to withhold food and drink from the mouth and stomach for a time, prophylactic treatment should be instituted.

(5) The mouth should be kept clean and moist by its own secretions, and the body should be abundantly supplied with water.

(6) A good way to excite the secretions of the mouth and to keep a current of saliva flowing *down* Stenson's duct is to allow the patient to *suck* on a stick of lemon candy after operation.

(7) A very accurate and effective way to supply the body with fluid is to administer salt solution by hypodermoclysis. If this be done according to Kavel's directions (see *Surg., Gynec., and Obstetrics*, 1916, p. 483) there will be no pain in the administration, and very little discomfort.

(8) If the prophylactic treatment fails and parotitis develops, and the inflammation is increasing or is no better by the third or fourth day, the gland should be uncovered by a free incision and punctured in several places with blunt forceps and the incision packed with wet sterile gauze, as suggested by Blair (*DENTAL COSMOS*, February 1918, page 172).

[*Proceedings of the Society of Experimental Biology and Medicine*, New York City, January 15, 1919.]

Does Normal Saliva Contain Uric Acid (Urate)? BY G. A. LOWENSTEIN AND WM. J. GIES.

This is a preliminary note, giving the results of a study whose details are to be published in the *Journal of Dental Research*. By use of a slight modification of the Folin-Benedict method for the determination of uric acid in the blood, the authors definitely established the presence of uric acid (urate) in saliva. The average quantity of uric acid in saliva from men is 2.10 mg. per 100 cc.; and for women 1.11 mg. per 100 cc. They

also succeeded in separating uric acid in crystalline form from saliva. For normal individuals, the proportion of uric acid in saliva was independent of diet, speaking generally, but was influenced by the rate of secretion as well as by the nature of the stimulant employed to accelerate the flow of saliva. Saliva appears to register promptly the variations in the endogenous metabolism

of uric acid. The authors noted an almost immediate rise in the proportion of uric acid in saliva after increased muscular exertion, and after ingestion of purin-free food following a brief fast. There was also observed a definite relationship between the quantity of uric acid excreted in saliva and the quantity eliminated simultaneously in the urine in normal people on an ordinary diet.

PERISCOPE

Hard Plaster-of-Paris Casts.—Such casts may be made without boiling them in stearin or wax. If one-third marble dust is added to the plaster while the mix is being made for the cast, the result will be a strong cast that will withstand heavy pressure and have a minimum expansion index.—F. W. F., *Pacific Dental Gazette*.

Vulcanite Tooth Replacement.—After selecting a tooth of the right mold and shade, it is fitted into the recess of the broken tooth, with clearance for the pins, but without cutting the pink vulcanite. Then a horseshoe-shaped loop several millimeters deep is cut in the vulcanite lingually to the tooth, leaving an island at the base sufficiently strong to resist a part of the strain that naturally will fall on this tooth. Now a small wire is twisted around the heads of the pins of the tooth and fitted into the horseshoe-shaped groove. Lastly the tooth and wire are fastened, and the case is finished by sealing the repair work with zinc phosphate cement. This makes a rapid, easy repair that will last from six months to several years.—*Hettinger's Dental News*.

Cyanosis in Nitrous Oxid Anesthesia.—Nitrous oxid anesthesia should not be accompanied by any degree of cyanosis. We adhere strictly to the rule that cyanosis is not only unnecessary but absolutely dangerous in nitrous oxid anesthesia. As long as the surfaces remain pink all is well. A study of patients who have died from nitrous oxid will show that the surfaces first became dusky, then cyanotic; later suffocation is complete, the respiratory center paralyzed, followed by death.

Great harm has been done by those anes-

thetists who have taught that cyanosis was necessary. We should remember that the patient cannot be in danger as long as the surfaces are pink. One advantage of nitrous oxid oxygen anesthesia is that the surgeon always has before him an exact index to the patient's condition in the appearance of the blood in the wound. As long as the blood is a healthy red color all is well. It should never become dark; here is one of the most exact and reliable danger signals.—CARL E. BLACK, *Journ. N. D. A.*

Early Recognition of Tumors in the Mouth.—In the practice of dentistry, it is well to have tumors, both innocent and malignant, constantly in mind. If a tumor is detected just as it is beginning to develop, and thereby the dentist saves the patient not only a great deal of discomfort—to say nothing of his life—he will also place himself in a quite enviable position in the community. By far the best means of diagnosis of a tumor or a suspected tumor is a histological one. In this diagnosis the history, age of the patient, length of time of existence of the tumor, its rate of growth, its gross physical characters and situation, its freedom of movement, attachment to surrounding and overlying structures and its relation to these, the microscopic character of sections removed for examination, the results of exploratory operation, and the outcome of therapeutic tests in the exclusion of syphilitic lesions, all play a very important part.

Any abnormal conditions in the oral cavity should immediately arouse the interest of the dentist. The first and most important question to be decided is whether the growth is benign or malignant.—MAX WASSMAN, JR., *Pacific Dental Gazette*.

Treatment of Superficial Gingivitis.—

Treatment of superficial gingivitis consists primarily in the removing of the cause, the local irritant, whatever it may be; ill-fitting appliances, etc., must be disposed of, and all calcareous deposits must be thoroughly removed. Prior to doing this it is advisable that the tissues involved be swabbed with a 50 per cent. alcoholic solution of official tincture of iodine for one or two days, morning and evening. A mouthwash which I find greatly beneficial in all inflammatory conditions of the mouth, is—

R—Postassium chlorate,	0.10 gm.
Fl. extr. Hamamelis	
Virginica,	100.00 “
Alcohol,	25.00 “

Sig. According to the more or less inflamed condition of the tissues, from one-half to one teaspoon in one-half or one full tumbler of water, rinsing the mouth from twice daily to as often as every hour.

This wash is to be used by the patient prior to beginning the local treatment, during the same, and until all traces of inflammation have disappeared. The same is to be followed as to the use of the solution of the tincture of iodine.—ARTHUR ZENTLER, *Dental Items of Interest*.

Matrix for Porcelain Inlays.—There are two methods of forming the matrix for a porcelain inlay, the direct and the indirect. Of the two methods, advantages are claimed for both, and I would say that when a careful technique is followed out, you can obtain results with the use of either. However, I am partial to the direct methods for the following reasons: That the operations can be made at one sitting; the advantage to study the color and tooth form; also I claim that you can get more accurate adaptation of the porcelain at the cavo-surface angles, which enables the operator to turn out an inlay with less overhang at that point.

In approximal surfaces, the matrix is cut one millimeter larger than the outline of the cavity at all points. The piece of platinum is set to place with a pair of foil pliers, and a burnisher is first used to carry it over the cavo-surface angles. Then a piece of spunk, that will fill the cavity, is moistened and pressed against the platinum, forcing it into the cavity with a ball burnisher. A flat-end orange-wood stick is then used, and with the aid of the mallet, this spunk is forced into the cavity, which carries the matrix against the walls and down into the angles. The spunk is removed; then a strip of medium rubber dam is passed around the tooth

over the platinum, and it is held tightly while the burnishing is completed, first by using a larger ball burnisher; then a smaller-sized one is used, working it well down into the cavity, and with a rounded point No. 6 explorer the final burnish is made down into the angles, which gives a clean angular outline to the matrix, reproducing the gingivo-axial, linguo-axial, labio-axial, and incisio-axial angles. The matrix is then removed and trimmed, leaving about one-half millimeter overlap at all points except at the linguo-cavo surface angle. At that place it should be trimmed so that it barely covers the angle. This enables the operator to remove the matrix from the labial surface with much greater ease. It is then replaced in the cavity, the rubber band passed around it, and held firmly while it is given a very careful reburnishing at all points. Care should then be taken in its removal from the cavity, so as not to change its form in the least, and if the proper care is used in baking the porcelain no change whatever will take place in the matrix.—J. E. ARGUE, *Journ. N. D. A.*

Treatment of Putrescent Teeth.—

The method of treating putrescent teeth in the dental department of Girard College today is to open these teeth carefully, applying 4 per cent. formalin, and by frequent applications of heated air, to liberate the formaldehyd gas, which joins the irritating gases and poisonous liquids, rendering them innocuous. By several applications of this kind and by removing the decomposed tissue as it is sterilized until near the end of the root, and then by modifying the strength of the drug to 2 per cent., the entire tooth is brought into an aseptic condition chemically. At the same time, by the use of drills and broaches, the root-canals are enlarged, and all septic material removed from the mouths of the tubuli communicating with the root-canals. If the technique of this operation has been carefully and thoroughly adhered to, the tooth can be filled at once. By this method, in almost all cases, we can fill such a tooth at one sitting, saving a great many subsequent appointments. We feel, however, that it is conservative to seal a treatment of creosote in the canals for about seven days before filling.

It must be borne in mind, however, that in the use of formalin the greatest care must always be observed, and that it should not be applied in the root except on a broach with a very small amount of cotton just moistened with the drug, and the treatment only carried to a point where an odor of

formaldehyd gas is given off, due to the liberation of the gas when heat is applied.

We are convinced that any drug containing formalin should never be sealed in a tooth, but by using formalin as has been described, the expansion of the gas in an open root-canal does not set up an irritation in the peridental membrane or apical space.

—S. P. CAMERON, *Dental Summary*.

Treatment of Non-Vital Teeth.—(1) All non-vital teeth must be radiographed in making the preliminary examination of a patient.

(2) The type of restoration of the crown of a tooth has a definite relation to apical infection.

(3) Upper and lower third molars should as a rule be extracted rather than treated.

(4) The treatment of the lower first molar apparently presents exceptional difficulties in the hands of the average practitioner.

(5) Badly infected teeth should be extracted unless particular care is taken in the treatment, and in checking up that treatment at intervals with the X-ray or by the bacteriological tests.

(6) If infection occurs at the apex of a treated tooth, it will probably occur within one year after treatment, excepting in those cases where infection reaches the root-filling later, on account of faulty sealing of that filling in the crown of the tooth.

(7) In treating a large rarefied area at the apex of a tooth, if that area extends less than half-way down the side of the root, it is a satisfactory procedure to re-treat the root-canal and resect the root-tip, placing an amalgam filling in the apex. It would certainly be preferable to re-treat the root before resecting, but in cases where this involves great difficulty, there is every reason to believe that a careful resection will eliminate the focus of infection even if the root-canal is not re-treated.—M. H. GARVIN, *Journ. of the N. D. A.*

Technique of Plaster Impression-Taking.—The following are practical details of methods employed by me in the course of considerable experience, both in private practice at home and in military work overseas, in the taking of plaster impressions. Before starting operations see that the patient is sitting in a quite upright position, if anything leaning a little forward. In edentulous cases the anatomical pattern of tray will be found the most convenient in use. The plaster should be mixed to fair consistence, not too thin, using a saturated solution of alum for the purpose. Enough plaster is then inserted

in the tray to come level with its edges, and the excess is wiped off. In the case of the upper jaw a portion of the mix should first be conveyed on the forefinger to the vault of the palate, and the cavity carefully filled in. This will prevent air-spaces in the resulting impression. The tray is then at once inserted in the mouth, the posterior portion being first placed in position, the anterior then gradually being brought forward and upward into position. Allow the impression to become thoroughly set before attempting removal. If there is any trouble about this the patient should be instructed to close the lips and blow out the cheeks with some force. Generally the impression will come away by this means, but if not, then the forefinger of each hand should be inserted at each side of the mouth, and the edges of the tray and plaster pressed firmly downward, when the impression will be released. In cases where teeth are standing a difficulty is often experienced in removing the plaster impression. This may be avoided by taking separate preliminary impressions in wax or composition of the individual teeth or groups of teeth. These miniature impressions are removed, chilled in water, and replaced in position, after which the plaster impression is taken in the usual way. After allowing time for complete hardening of the plaster the tray is easily removed with the wax or composition *in situ*.—Capt. J. J. ARMITAGE, *British Dental Journal*.

A Case of Cancer of the Pericementum.

—Arthur Hopewell-Smith has the distinction of having discovered and diagnosed the only cancer of the pericementum as yet on record. The case was that of a patient under the care of a dentist in London who extracted an upper left central incisor. The patient was a young woman, and the pulp had previously been removed and the root-canal treated. The extracted incisor was sent to Dr. Hopewell-Smith for the diagnosis of a peculiar formation of tissue found around the root. Microscopic slides were made of this tissue, and after due study it was pronounced by Dr. Hopewell-Smith a burrowing epithelioma. Cell nests were found, and were thought to be a sufficient diagnostic guide to warrant his pronouncing it a cancer, so he reported back to the dentist. The patient was the wife of a physician, who knew what the decision meant. To further study the case the second left incisor was extracted, and showed the same tissue, then the left canine, which also showed the same tissue. There were no external signs showing any kind of

trouble whatever. Great discussion resulted among the consulting surgeons. One of these consulting surgeons made an exploratory incision, and found the presence of a large malignant growth which extended as far back as the third molar. As a result he excised the maxilla. The patient fully recovered, and today wears an obturator. This operation took place in 1901. To us as dentists the pathological history of the case is interesting. "The pulp was infected through a carious cavity and died; it then set up a suppurative inflammation around the apex. The pus pointed and left behind it an incurable sinus which would suggest—at any rate after the tooth had been sterilized—that some portion of the tooth was necrosed. The necrosed portion, acting as an irritant, would cause a hypertrophy of the stripped-up pericementum, and a proliferation of the epithelium therein. The pain, though not great, would put the tooth out of use, and the pericementum, which was not thickened, would be functionally isolated. We have, therefore, a functionally isolated pericementum in an otherwise healthy body. According to this theory, then, the nice balance existing between the cells of the pericementum is lost, the epithelium reverts to its ancestral powers of division, and burrows into the surrounding tissues, whose physiological resistance is reduced; and thus the cancer is born."—MAX WASSMAN, JR., *Pacific Dental Gazette*.

The Technique of Root-resection.—The operation is invariably done under regional or conduction anesthesia. If it is feared that the patient may become hysterical during the operation or suffer from mental shock, a hypnotic, such as veronal, or a narcotic, such as codein, is given fifteen to twenty minutes before injecting for anesthesia. A sterile head-cap is placed on the patient's head. Then a modified Killian head-band, devised by Dr. F. B. Moorhead, to which adjustable lip and cheek retractors can be attached, is placed about the head. The retractors are adjusted. A pad of sterile gauze is placed between the upper and lower teeth on the side to be operated on, and the patient is instructed to keep the teeth closed on it. The gums and adjacent teeth are wiped, painted with Keys-All solution of iodine (chinosol), then washed with alcohol. A

cresecentic flap is cut, extending about five mm. mesially and distally from the center of the root to be resected. This is turned back and held either with a retractor or tenaculum. If upon turning back the flap it is found that the cortical portion of the bone has been infiltrated by the infection process, the inner surface of the flap should be examined with a magnifying glass for degenerative granulations, and these must be cut away with curved scissors. If a fistula has existed, the edges of the fistula should be cut away, and the fistula sutured independently when the flap is sewed in place.

The bone over the infected apex is removed with spoon excavators, small gouge chisels, or burs, using as little force as possible. If a bur is used it should be run slowly, and with light pressure. When the root is exposed, it is cut through with a fissure bur of about 2 mm. diameter. The root-tip can then be easily removed with an excavator. The bone cavity is thoroughly curetted, washed out with sterile physiological salt solution, and ferro-pyrin is applied to it. The stump of the root is dried and examined. No portion of the stump must be left extending into the bone cavity.

A saturated solution of silver nitrate is now applied to the stump surface by means of a fine, flexible explorer, with just the tip wound with cotton. This must be done carefully, so that the silver solution is not smeared on the soft tissue or the cancellous bone structure. A gentle blast of oxygen is directed on the stump until the silver solution is oxidized and dried. The cavity is then recuretted and irrigated. The edges of the flap should be carefully approximated and sewed together with two superficial sutures of horsehair, which do not penetrate the periosteum.

The line of the incision is dusted with ferro-pyrin. This forms a strong coagulum and prevents fluids of the mouth from seeping into the area of operation. The whole surface is painted with compound tincture of benzoin. When this has dried, the head-band, retractors, and occlusal pad are removed. The patient is dismissed, with instructions to rinse the mouth hourly with Dobell's solution or with a soda-salt solution, half-teaspoonful of each to a glass of water.—JOHN E. NYMAN, *Dental Items of Interest*.

OBITUARY

Dr. James G. Templeton.

[SEE FRONTISPIECE.]

DIED, February 7, 1919, at the home of his daughter, Mrs. Walter M. Lindsay, Pittsburgh, Pa., from infirmities of old age, JAMES GABBY TEMPLETON, A.M., Sc.D., D.D.S.

Dr. Templeton was born on a farm near West Middletown, Washington county, Pa., November 10, 1833, the son of Alexander Templeton and Margaret Gabby Templeton. He obtained his early education in the public schools of Washington county and Cross Creek Academy, later entering Westminster College at New Wilmington, Pa., from which institution he received the A.M. degree. Early in life he became interested in the profession of dentistry, and served an apprenticeship under the late Dr. Cochran Palmer, later entering the Pennsylvania College of Dental Surgery, from which institution he received the D.D.S. degree in 1860. At the same time that he was attending the courses of the Pennsylvania College of Dental Surgery, he also attended lectures at Jefferson Medical College. He received the honorary degree of Sc.D. from the University of Pittsburgh in 1917. He entered the practice of dentistry at Pittsburgh in 1860, immediately after his graduation.

Dr. Templeton was active in dental educational matters and was one of the organizers of the Pittsburgh Dental College, now the School of Dentistry of the University of Pittsburgh, in the year 1895. He was dean and professor of materia medica and therapeutics of the Pittsburgh Dental College for several years. He was widely known throughout the United States as a leader in the dental profession, and for many years attended society meetings in Pennsylvania and surrounding states, always taking an active part in the meetings. On account of ill health he retired some years ago from active practice, and it was a source of keen disappointment to him that he was unable to

attend the fiftieth anniversary of the Pennsylvania State Dental Society, of which he had long been an active member. He was a charter member of the Pennsylvania State Dental Society, and served as its president in the year 1872; a member of the Odontological Society of Western Pennsylvania, the Lake Erie Dental Society, the Ohio Dental Society, and an honorary member of the Psi Omega Fraternity.

Dr. Templeton was married at Pittsburgh, 1863, to Miss Laura J. Van Orsdell, and is survived by three daughters. The interment took place February 10, 1919, in Uniondale Cemetery, North Side, Pittsburgh, Pa.

George Cunningham, M.A.Cantab., L.D.S.Eng., D.M.D.Harv.

WE regret to record the death of Mr. GEORGE CUNNINGHAM, which took place on March 5th, at a hospital in London, after a short illness.

The deceased was born sixty-seven years ago in Edinburgh, where later he studied at the university. Subsequently he went to Paris and became interested in dentistry. He was one of the first Englishmen to go to America to study, and in 1876 took the D.M.D. degree at Harvard University. In the first *Dentists' Register*, published in 1879, his name appeared under the heading of "foreign dentists" on his Harvard qualification, the only other name in the list being that of Dr. T. Wilson Hogue.

Mr. Cunningham began practice with his brother, the late Mr. C. M. Cunningham (of Belfast), at 4 York Row, Wisbech. He joined the British Dental Association in 1879, and was one of the few surviving original members. In 1883 he moved to Cambridge and practiced at 2 King's Parade for many years. He took the M.A. degree of Cambridge from Downing College in 1887, and in the same year obtained the L.D.S. diploma of the Royal College of Surgeons of England, after which his name was transferred from the foreign

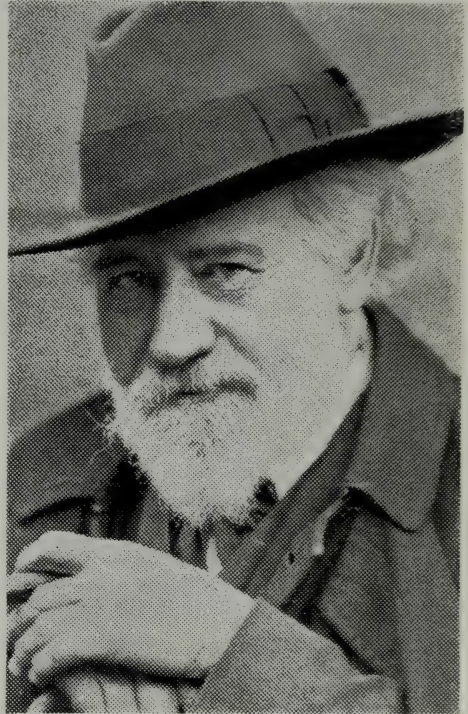
list to that of registered British dentists. His skill as a dentist and his intellectual gifts soon won him a prominent place in the university town, both professionally and socially. He early devoted himself with characteristic energy and enthusiasm to dental politics. By dint of persistent efforts in a difficult and scattered area he was largely instrumental in forming the Eastern Counties Dental Association in 1881, which was merged two years later into the Eastern Counties branch of the association. Of this branch he became honorary secretary and president, and finally honorary member.

Of his work in the larger activities of the association much might be written. For two decades he was a conspicuous, challenging figure in dental politics on the committees and the representative board, and at the annual meetings of the association. In debate he was alert, combative, at times brilliant, and a fine speaker. He always asserted the right of "the dentist *qua* dentist" (as he put it) to full recognition in all conditions and circumstances, whether in the sphere of Government departments (like the War-office, the Admiralty, and the Board of Education), or of medical or educational authorities.

* * * * *

He took part in 1893 in the World's Columbia Dental Congress, which awarded him its gold medal for his essay on "Tooth Preservation." To the International Dental Congress in Paris in 1900 he contributed four papers, besides demonstrations. He was associated with Dr. Godon of Paris and Dr. Harlan of Chicago in founding the International Dental Federation in 1900 in Paris. When the Federation held its first meeting in London and Cambridge in 1901, with Sir Michael Foster as honorary president, Mr. G. Cunningham was the moving spirit in its organization, and the "guide, philosopher, and friend" of all the foreign visitors. At international dental gatherings his enthusiasm, bonhomie, and love of good fellowship were given full play, whether in Paris, Berlin, Amsterdam, The Hague, or Stockholm. At the Stockholm meeting in 1912 he demonstrated the first dental "moving picture" in a biograph theatre. The film showed in different stages the anatomical appearances of the jaws and teeth, the eruption of the first molar, dental caries, and the treatment

of school children at the Cambridge Borough Dental Institute. He was vice-president of the Hygiene Commission of the F. D. I. and corresponding member of various Amer-



GEORGE CUNNINGHAM.

ican and foreign dental societies. For many years he lectured on operative dental surgery at the National Dental Hospital, and later was appointed dental surgeon to the London Hospital. He started and for a time carried on in the West End of London the Institute of Dental Technology, which was, however, doomed to early failure.

One of his principal achievements was his persuading the town of Cambridge in 1907 to appoint a school dentist, thus carrying to fruition the ideal sketched by W. M. Fisher. The education committee was then only empowered to pay £50 a year for dental inspection of elementary school children, but the expense of treatment (£360 for salary of school dentist, etc.) was provided by the generosity of Mr. Sedley Taylor, Fellow of Trinity College, an old friend of Mr. Cunningham's. The work done during the first

twelve months, ending October 1908, was fully reported on by Mr. A. W. Gant (the first school dentist) and Mr. Cunningham, who had acted as honorary director of the Cambridge School Children's Dental Institute. In the following year the whole scheme was taken over by the town council, with the consent of the Board of Education. Remarkable results have followed from the Cambridge pioneer school dental clinic, the most striking being the fact that at the present moment, we believe, about 80 per cent. of the elementary school children have sound permanent teeth.

On the outbreak of war he submitted to the War-office a scheme for a motor dental surgery, with X-ray and electrical equipment, and later a gas-mask of his own design. He gave dental lectures with the help of cinema films and lantern slides to the officer-cadets in training at Cambridge. In 1916 he was granted a Civil-list pension of £50 in recognition of his services to the study of dentistry and of his straitened circumstances. At the annual meeting of the association in 1917 he was elected an honorary member.

At one time he was a well-known member of the National Liberal Club, also an official of the National Skating Association, and was a keen propagandist of Esperanto.—H. A., *British Dental Journal*.

Dr. Thomas J. Giblin.

DIED, February 2, 1919, at his home in Dorchester, Mass., after an illness of more than two years, THOMAS J. GIBLIN, D.M.D.

Dr. Giblin was born in Lowell fifty-seven years ago, son of Mr. and Mrs. John A. Giblin. While he was yet a young man, Dr. Giblin's parents removed to South Boston, where his father was for many years connected with the assessor's office in City-hall, and postmaster at the South Boston station during the administration of President Cleveland.

Dr. Giblin was educated in the schools of South Boston, Boston College, and Harvard Dental College. In 1885 he received the degree of D.M.D. from the last-named college and took up the practice of his profession in South Boston.

During his college days Dr. Giblin took a prominent part in amateur theatricals, and kept up his interest in them until his death.

He appeared in several productions in various parts of New England for charity.

Dr. Giblin took a deep interest in work among the poor, and donated his services both professionally or to give financial or material aid when called upon. He served as president of the Society of St. Vincent de Paul of the Gate of Heaven Church, South Boston, for many years. He was a councilor of the Metropolitan Council of St. Vincent de Paul Society and a member of the governing board of St. Mary's Infant Asylum. He took an active interest in the work of the Knights of Columbus and Massachusetts Catholic Order of Foresters, and assisted in the war work of both.

He is survived by his wife, who was Miss Mary O'Connor, a sister, and five children—Lieut. John A. Logan of the 101st Engineers; Dr. Thomas J. Giblin, Jr., who succeeded to his father's practice when the latter was obliged to retire on account of ill health two years ago, and three daughters, Mary, Louise, and Constance. Another daughter, Miss Katherine, died last year.

Dr. Charles Dudley Winsor.

DIED, Thursday, January 23, 1919, at his home in Whitford, R. I., after a short illness, CHARLES DUDLEY WINSOR, D.D.S.

Dr. Winsor was born in Providence, R. I., November 25, 1868, the son of James B. and Abbie W. Winsor. He obtained his early education in the public schools of Providence. He studied dentistry in the office of Dr. Davenport of Providence, and later with Dr. W. P. Church. In 1890 he entered the Philadelphia Dental College, being graduated from that institution in 1892. He immediately returned to Providence and again associated himself with Dr. Church, later opening an office alone at 86 Weybosset st., where he continued to practice his profession until the time of his death.

Dr. Winsor was well and favorably known in dental circles of New England, and succeeded in establishing a splendid practice, and it was a severe shock to his friends and his patients to learn of his sudden and untimely death. He was a member of the Rhode Island Dental Society, the New England Dental Association, and an honorary member

of the First District Dental Society of the State of New York.

Dr. Winsor was married in May 1911 to Miss Louise W. Green of Bowdenheim, Me., who survives him. ———

The following resolutions on the death of Dr. CHAS. DUDLEY WINSOR were adopted by the Rhode Island Dental Society:

Whereas, an all-wise Providence, in its infinite wisdom, has taken from our midst one of our highly esteemed members, Dr. Chas. Dudley Winsor; therefore be it

RESOLVED, by the Rhode Island Dental Society, That we have suffered a loss in his demise. Our state and city suffer alike in the loss of his valued civic service, and our profession in his example of high ideals and technical skill; and be it further

RESOLVED, That these resolutions be spread upon the minutes of this society and published in the professional papers, and that a copy be sent to his widow.

CHAS. H. DAVIS,
JAMES E. HEAP,
WM. P. CHURCH.

ARMY AND NAVY DENTAL NEWS

Dental Officers Who Died While on Active Duty.

[Following is a list of the dental officers who died while on active duty. It may be possible that other names should be added to this list, but to date these are all that have been officially recorded in the Surgeon-general's office. The list will be published in the bound Transactions of the National Dental Association; therefore we would appreciate any corrections or additions to the list.—ED., *Journ. N. D. A.*]

Killed in action:

Ambelang, Leslie P., Cascade, Wis.
Desmond, Walter P., 1st Lt., address not available.
Morrissey, Edward M., 1st Lt., Kenosha, Wis.
Parsons, Joseph H., 1st Lt., Erie, Pa.
Stone, Leslie A., 1st Lt., Pittsfield, Mass.
Wald, Alfred G., 1st Lt., Huntington, Pa.

Died from diseases:

Allison, Lester J., Iowa City, Iowa.
Augenstein, Melvin M., Capt., Hagerstown, Md.
Ballachey, Fred'k A., 1st Lt., Buffalo, N. Y.
Baris, Alexander D., Brooklyn, N. Y.
Birdsong, Horace R., 1st Lt., Lula, Miss.
Bliss, Vance W., 1st Lt., Santa Cruz, Cal.
Boazman, Francis E., 1st Lt., Chappells, S. C.
Boisseau, Chas. H., 1st Lt., Smithton, Pa.
Casselman, Ernst L., 1st Lt., Effingham, Ill.

Crandage, Walter, Capt., Bridgeport, Conn.
Davies, Oliver W., 1st Lt., Los Angeles, Cal.
Duwe, Harry E., 1st Lt., Arlington, Iowa.
Earley, Joseph R., 1st Lt., New Castle, Pa.
Fickes, Ralph H., 1st Lt., Vandergrift, Pa.
Fleming, Lionel G., 1st Lt., St. Martinville, La.

Fletcher, Roland E., 1st Lt., Mt. Vernon, N. Y.
Friday, Gale, 1st Lt., Fremont, Ind.
Glass, Roy S., 1st Lt., Frackville, Pa.
Hannah, Clark B., 1st Lt., Gen. Delivery, Los Angeles, Cal.
Hanson, Roy E., 1st Lt., Cambridge Springs, Pa.

Henry, Carl R., Cuba, Ill.
Hensaw, Winfield E., 1st Lt., Peru, Ill.
Higgins, John C., McAdoo, Pa.
Hoffman, Wade H., 1st Lt., Oil City, Pa.
Jones, Alex. H., 1st Lt., Youngstown, Ohio.
Jones, Earl P., Mansfield, Ohio.
Kreitman, Albert L., 1st Lt., New York City.
Leonard, Frank S., 1st Lt., Indianapolis, Ind.

Lubitz, Wm. M., 1st Lt., Brooklyn, N. Y.
McNett, Frank E., 1st Lt., LaCrosse, Wis.
Mattox, George W., 1st Lt., Elberton, Ga.
Moffett, Samuel F., 1st Lt., Cottello, Texas.
Morin, Adrian L., 1st Lt., San Francisco, Cal.

Niles, Will C., 1st Lt., Newton, Mass.
Osborne, Lloyd A., Fremont, Iowa.
Patterson, Roy A., 1st Lt., Hennessey, Okla.
Peterson, Walter F., 1st Lt., Minneapolis, Minn.

Postle, Merton M., Major, Chicago, Ill.
Reinhard, Walter O., 1st Lt., Rio, Wis.

Sanderson, Mortimer, Lt.-col., Regular U. S. Army.

Simons, John S., 1st Lt., Henderson, Minn.
Simm, Francis R., 1st Lt., Pierre, S. D.
Smith, Cecil C., 1st Lt., Violet Hill, Ark.
Staples, Bernard F., 1st Lt., Boston, Mass.
Stockler, Delmar H., 1st Lt., Tunkhannock, Pa.

Walker, Raymond A., 1st Lt., New Haven, Conn.

Wall, Harrison B., Capt., Cleveland, Ohio.

Weidert, Raymond M., Wilcox, Pa.

Zwink, Edwin B., 1st Lt., Eustis, Neb.

—*Journ. N. D. A.*

Assignments.

Army Dental Corps.

Week ending February 15th.

Maj. Guy P. Bannister to Walter Reed General Hospital, D. C., for duty.

Maj. Harry P. Bachman to Camp Pike, Ark., for duty in base hospital.

Week ending February 22d.

Lieut.-col. George I. Dunckel to Philippine Islands for duty.

Maj. Don G. Moore to Camp Meade, Md., for duty.

Maj. Joseph H. Tyler to Philippine Islands for duty.

Week ending March 1st.

Lieut.-col. Minot E. Scott to Hoboken, N. J., port of embarkation, for duty.

Maj. Crittenden Van Wyck to Sheffield, Ala., nitrate plant No. 1, for duty.

Maj. Arnett P. Matthews to United States and report for instructions.

Week ending March 22d.

Col. John H. Hess to Chicago, and report to commanding general Central Department for duty.

Col. Alden Carpenter report at Fort Sam Houston, Tex., for duty as Southern Department dental surgeon.

Lieut.-col. George I. Gunckel to Army Medical School for physical examination for tropical service.

Maj. William A. Squires to Fort McPherson, Ga., for duty.

Maj. Harry C. Peavey to Ayer, Mass., Camp Devens, for duty.

Maj. Richard B. Clark to Washington, and report to director of purchase, storage, and traffic division for duty.

Maj. Archibald L. Miller to Fort McHenry, Md., general hospital 2. for duty.

Week ending March 29th.

Maj. Edward F. Lafitte to St. Louis, Mo., general hospital 40, for duty.

The following to Hawaiian Department for duty: Maj. Wilfurth Hellman, Capt. Jerome L. Fritsche and Clement J. Gaynor, 1st Lieuts. Howard C. Feyler and John R. Wikeen.

Capt. Page P. A. Chesser to Colonia, N. J., general hospital 3, for duty.

Capt. Thomas M. Terry to St. Louis, Mo., general hospital 40, for duty.

Capt. John J. W. Ross to Camp Lee, Va., for duty.

Capt. Howard A. Hale to San Francisco, Letterman General Hospital, for duty.

Resignation by 1st Lieut. Carl H. West (regular army) accepted.

Week ending April 5th.

Maj. Howard I. Benedict to Fort Oglethorpe, Ga., general hospital 14, for duty.

Maj. John H. Snapp to Fort Sheridan, Ill., general hospital 28, for duty.

Capt. Fletcher D. Rhodes to Jefferson Barracks, Mo., for duty.

Capt. Harry C. Mentz to Hoboken, N. J., port of embarkation, for duty.

Week ending April 12th.

Majors Leigh C. Fairbank and Samuel J. Randall from Philippine Department to San Francisco, and report for instructions.

Maj. Wm. A. Heckard, Capt. Dudley C. Hughes and Harry E. Rice to Hoboken, N. J., port of embarkation, for duty.

Capt. Harold J. Parker and 1st Lieut. Wm. F. Wieck to Philippine Islands for duty.

Navy Dental Corps.

Week ending April 12th.

Lieut. (Jn.Gr.) E. J. Noonan, detached from duty at the naval radio school, Harvard University, Cambridge, Mass.; to duty at the naval radio school, Great Lakes, Ill.

Lieut. (Jn.Gr.) L. V. Feike, detached from duty at the naval training station, Great Lakes, Ill.; to duty at the naval hospital, Great Lakes, Ill.

Lieut. (Jn.Gr.) T. S. Johnson, detached from 1st naval district: to Portsmouth, N. H.

Lieut. (Jn.Gr.) J. F. Good, detached from duty at the naval radio school, Harvard; to duty at naval training camp, Bumpkin Island, Mass.

Lieut. L. H. Brown, letter of March 3, revocation of probationary appointment, modified, detached from navy yard, Puget Sound; to home, probationary appointment as a lieutenant. U. S. N., revoked on arrival home.

Lieut. (Jn.Gr.) O. F. Willing, detached from duty naval training camp, Pelham Bay Park, N. Y.; to duty on Connecticut.

Lieut. (Jn.Gr.) Jacob Sussman, detached from duty on receiving ship at New York; to duty on Virginia.

Lieut. (Jn.Gr.) T. P. Stack, detached from duty on receiving ship at New York; to duty on Ohio.

Lieut. (Jn.Gr.) W. H. K. McDiarmid, detached from duty at naval training camp, Pelham Bay Park, N. Y.; to duty on Rhode Island.

Lieut. (Jn.Gr.) P. W. Fitzpatrick, detached from duty at naval training station, Newport, R. I.; to duty on Nebraska.

Lieut. (Jn.Gr.) G. S. Maynard, detached

from duty on receiving ship at New York; to duty on Henderson.

Lieut. (Jn.Gr.) P. S. Gilliam, navy yard, Philadelphia, modification of orders of March 15th modified, addressed naval air station, Bay Shore, L. I., N. Y., to read detached from duty naval air station, Bay Shore, L. I., N. Y.; March 28th, to duty Philadelphia, Pa., navy yard.

Promotions.

Announced February 15th:

To be MAJORS—permanent establishment, from October 6, 1917: First Lieuts. Neal A. Harper, Earle J. McClung, Earl L. Hering, Jacob L. Brause, Hugh M. Tarpley, and Albert S. Cumming.

Preparedness League of American Dentists.

ORGANIZED UNDER THE AUSPICES OF THE N. D. A.

Preparedness League Notes and News.

FROM PRESIDENT BEACH.

OUR DUTY.

EARLY last autumn the President of the League wrote to different members of the dental corps in France seeking information as to the condition of the dental profession in the devastated regions, but has been unable to get definite data except from Captain Blake Sears, who has, during his available time, been making a survey of those conditions which call for aid from the dental profession of America and Canada.

In a partial report Captain Sears states that there is a great need for help, and strongly approves of action in this direction. The matter was brought to the attention of Dr. Villain, who heartily indorses the movement, and is anxious to collaborate with us. He was one of the organizers of a society in Paris (l'Aide Confraternelle) to carry on this work. Funds were raised, which already have been exhausted, and the time is opportune for us to show our fraternal spirit by raising funds and supplying equipment for this society to place where it is most needed. Before this notice will be printed, we hope the movement will be well under way, and some funds made available for this purpose.

In an editorial in the *Cosmos* for January, 1918, Dr. Kirk made an urgent appeal to the profession of the United States with but indifferent results. We recommend that our members re-read this article now that active warfare has ceased and we are turning our attention to reconstruction in every direction.

We take especial pleasure in announcing that the first contribution of \$25 has been received from Dr. Albert Crosby, New Haven, Conn., April 11, 1919. This has recently been followed by a subscription from Dr. F. T. Murlless, Jr., Hartford, for a like amount, and \$500 from the Connecticut Dental Association. No more worthy purpose is before our profession today. Subscriptions may be sent to the President of the Preparedness League, 131 Allen st., Buffalo, N. Y., or the Treasurer, Dr. L. M. Waugh, 576 Fifth ave., New York, N. Y., through whom they will be forwarded to the treasurer of l'Aide Confraternelle. Subscriptions will be acknowledged in these columns and a strict accounting of the funds will be made to the profession.

HOME SERVICE WORK.

We are getting reports from different parts of the country of the excellent service our members are giving the worthy families of

the soldiers and sailors. This is a most commendable object, and we sincerely trust that it will be continued so long as there is actual need. It is a splendid and practical way of demonstrating our readiness to help compensate for the sacrifices made by our boys.

J. W. BEACH, *President.*

LETTER FROM DR. GEORGES VILLAIN.

NEW YORK, N. Y., April 4, 1919.

Dr. J. W. BEACH, President Preparedness League of American Dentists, Buffalo, N. Y.

My dear Doctor,—The dentists of Northern France and Belgium have suffered terribly during the war. The Germans have removed and taken to Germany or destroyed all their material. We have to help most of them. Other dentists, half of the French practitioners, have left their offices since August 1917, and will have to build over all their practice. Some have been wounded to an extent that will oblige the use of special outfits to enable them to carry on their professional activity. Others are mutilated, and will not be able to practice any more.

Many have been killed, and some of those left children in distress. To every one of them we must bring assistance when needed. For that purpose we have organized in France in 1915 a special professional committee called "Aide Confraternelle"—"Aux dentistes français et belges—victimes de la guerre." This committee has raised in France over Fr.110,000, but of course this is but a small sum of money considering the great needs anticipated.

Our professional brothers have given their lives, their limbs, or their wealth, which amounted sometimes to only the value of their material, for the cause of liberty and freedom of the world, which is the cause of every one of us. By what they have given we benefited—that is why we cannot do too much. France has so much to do, and everyone over there suffered so much, that we cannot expect much better result than the one obtained.

Dr. Kirk in the COSMOS called on the profession in the United States to help us. Dr. Dubeau in Canada did the same among French Canadians. If you will undertake something toward this action in the Preparedness League of American Dentists, you will honor yourself and the profession. Needs are immediate for a certain number of our professional war victims. They can be delayed for others, as the demobilization is gradually and slowly performed.

For this reason money can be collected in

two ways: Those who can should give immediately all they consider to be their proper share; others can graduate their pecuniary efforts by making written obligations to give so much a year during five years, which can be negotiated through banks. Those who cannot afford to give money can give material and instruments;—everything is needed.

This material will enable the professional victims of the war to begin practice anew, and will be returned to the "Aide Confraternelle" as soon as the beneficiary can afford to buy his own. It will then be turned over to another dentist who needs it to reopen his office in the town in which he practiced before the war, and which having been more or less damaged will, by that time, be sufficiently rebuilt to receive him. Bear in mind that a Frenchman loves his "village," and always comes back to it.

Part of the material taken over by the U. S. Army and Navy may be obtained from your official representation, and would help and save time. I shall send you copies of rules and regulations of the "Aide Confraternelle." Money can be sent to the treasurer of that committee, Dr. Fontanel, 1 Rue Vercingetorix, Paris.

I am ready to give you all further information needed. With most grateful sentiments for what you will do, believe me,

Yours, GEO. VILLAIN.

LETTER OF APPRECIATION FROM THE SURGEON-GENERAL U. S. ARMY TO THE PREPAREDNESS LEAGUE.

OFFICE OF THE SURGEON-GENERAL,
February 5, 1919.

Dr. J. W. BEACH, Pres., Preparedness League of American Dentists, Buffalo, N. Y.

Dear Doctor,—Having been advised of the gratuitous services rendered by the members of the Preparedness League of American Dentists in assisting to make dentally fit the Selective Service men after they had been accepted by their local boards and previous to their induction into military service, and having learned that about half a million dental operations were performed by members of this organization for those entering military service without expense to the Government or the soldier, I desire to convey to you, the President, and through you to the remaining officers and members, by either letter or in person, my sincere appreciation of the patriotic services rendered.

Very truly yours,

M. W. IRELAND,
Surgeon-general, U. S. A.

SPECIAL NOTICE.

Amendment of the Harrison Anti-Narcotic Law.

THE Harrison Anti-Narcotic Law, which is in form a special tax requirement, is amended and materially strengthened. Heretofore taxes were laid only on dealers in the drugs covered by the Act. By the present law a tax is also imposed upon the drugs themselves, and it is made unlawful to sell them except according to the regulations provided, and in or from original stamped packages, and possession of any of the drugs enumerated, in unstamped packages, unless obtained from a registered dealer on a *bona-fide* prescription, or possession of stamped packages by any person other than a registered dealer, is made *prima facie* evidence of violation of law. Unstamped packages are made liable to seizure and forfeiture, and all forfeited drugs, upon conviction, and any of the drugs seized from unknown persons are to be delivered to any department or bureau of the Government for medical or scientific purposes.

Section 6 of the Harrison law exempted from the provisions of that Act compounds containing not more than $\frac{1}{10}$ of a grain of any of the prohibited drugs to the ounce. This section is amended so as to slightly change the amounts of opium, etc., which may be contained to the ounce, and every dealer is required to register and keep a record of all sales of any of such preparations which do not contain sufficient of the prohibited drugs to bring them within the requirements of the Act as to sale on prescription.

SECTION 1006.

That Section 1 of the Act of Congress approved December 17, 1914, is hereby amended to read as follows:

"SEC. 1. That on or before July 1 of each year every person who imports, manufactures, produces, compounds, sells, deals in, dispenses, or gives away opium or coca leaves, or any compound, manufacture, salt, derivative, or preparation thereof, shall register with the collector of internal revenue of the district his name or style, place of business and place or places where such business is to be carried on, and pay the special taxes hereinafter provided;

"Every person who on January 1, 1919, is engaged in any of the activities above enumerated, or who between such date and the passage of this Act first engages in any of such activities, shall within 30 days after the passage of this Act make like registration, and shall pay the proportionate part of the tax for the period ending June 30, 1919; and

"Every person who first engages in any of such activities after the passage of this Act shall immediately make like registration and pay the proportionate part of the tax for the period ending on the following June 30th;

"Importers, manufacturers, producers, or compounders, \$24 per annum; wholesale dealers, \$12 per annum; retail dealers, \$6 per annum; physicians, dentists, veterinary surgeons, and other practitioners lawfully entitled to distribute, dispense, give away, or administer any of the aforesaid drugs to patients upon whom they in the course of their professional practice are in attendance, shall pay \$3 per annum.

"Every person who imports, manufactures, compounds, or otherwise produces for sale or distribution any of the aforesaid drugs shall be deemed to be an importer, manufacturer, or producer.

"Every person who sells or offers for sale any of the said drugs, in the original stamped packages, as hereinafter provided, shall be deemed a wholesale dealer.

"Every person who sells or dispenses from original stamped packages, as hereinafter provided, shall be deemed a retail dealer: *Provided*, That the office, or if none, the residence, of any person shall be considered for the purpose of this Act his place of business; but no employee of any person who has registered and paid special tax as herein required, acting within the scope of his employment, shall be required to register and pay special tax provided by this section. . . .

"It shall be unlawful for any person required to register under the provisions of this Act to import, manufacture, produce, compound, sell, deal in, dispense, distribute, administer, or give away any of the aforesaid drugs without having registered and paid the special tax as imposed by this section.

"That the word 'person' as used in this Act shall be construed to mean and include a partnership, association, company, or corporation, as well as a natural person; and all provisions of existing law relating to special taxes, as far as necessary, are hereby extended and made applicable to this section.

"That there shall be levied, assessed, collected, and paid upon opium, coca leaves, any compound, salt, derivative, or preparation thereof, produced in or imported into the United States, and sold, or removed for consumption or sale, an internal-revenue tax at the rate of 1 cent per ounce, and any fraction of an ounce in a package shall be taxed as an ounce, such tax to be paid by the importer, manufacturer, producer, or compounder thereof, and to be represented by appropriate stamps, to be provided by the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury; and the stamps herein provided shall be so affixed to the bottle or other container as to securely seal the stopper, covering, or wrapper thereof.

"The tax imposed by this section shall be in addition to any import duty imposed on the aforesaid drugs.

"It shall be unlawful for any person to purchase, sell, dispense, or distribute any of the aforesaid drugs except in the original stamped package or from the original stamped package; and the absence of appropriate tax-paid stamps from any of the aforesaid drugs shall be *prima facie* evidence of a violation of this section by the person in whose possession same may be found; and the possession of any original stamped package containing any of the aforesaid drugs by any person who has not registered and paid special taxes as required by this section shall be *prima facie* evidence of liability to such special tax: *Provided*, That the provisions of this paragraph shall not apply to any person having in his or her possession any of the aforesaid drugs which have been obtained from a registered dealer in pursuance of a prescription, written for legitimate medical uses, issued by a physician, dentist, veterinary surgeon, or other practitioner registered under this Act; and where the bottle or other container in which such drug may be put up by the dealer upon said prescription bears the name and registry number of the druggist, serial number of prescription, name and address of the patient, and name,

address, and registry number of the person writing said prescription; or to the dispensing, or administration, or giving away of any of the aforesaid drugs to a patient by a registered physician, dentist, veterinary surgeon, or other practitioner in the course of his professional practice, and where said drugs are dispensed or administered to the patient for legitimate medical purposes, and the record kept as required by this Act of the drugs so dispensed, administered, distributed, or given away.

* * * * *

"That all unstamped packages of the aforesaid drugs found in the possession of any person, except as herein provided, shall be subject to seizure and forfeiture, and all the provisions of existing internal-revenue laws relating to searches, seizures, and forfeitures of unstamped articles are hereby extended to and made to apply to the articles taxed under this Act and the persons upon whom these taxes are imposed.

"Importers, manufacturers, and wholesale dealers shall keep such books and records and render such monthly returns in relation to their transactions in the aforesaid drugs as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, may by regulations require.

"The Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, shall make all needful rules and regulations for carrying the provisions of this Act into effect."

SECTION 1007.

That Section 6 of such Act of December 17, 1914, is hereby amended to read as follows:

"SEC. 6. That the provisions of this Act shall not be construed to apply to the manufacture, sale, distribution, giving away, dispensing, or possession of preparations and remedies which do not contain more than two grains of opium, or more than one-fourth of a grain of morphin, or more than one-eighth of a grain of heroin, or more than one grain of codein, or any salt or derivative of any of them in one fluidounce, or, if a solid or semi-solid preparation, in one avoirdupois ounce; or to liniments, ointments, or other preparations which are prepared for external use only, except liniments, ointments, and other preparations which contain cocain or any of its salts, or alpha or beta eucain or any of their salts or any synthetic substitute for them: *Provided*, That such remedies and preparations are manufactured, sold, distributed, given away, dispensed, or possessed as medicines and not for the purpose of evading the intentions and provisions of this Act."

* * * * *

SOCIETY NOTES AND ANNOUNCEMENTS

NOTICES should reach the Office of the DENTAL COSMOS *not later* than the 11th or 12th of the month preceding that of publication.

Coming Dental Society Meetings.

With the National.

NATIONAL DENTAL ASSOCIATION. New Orleans. October 20th to 24th.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS. New Orleans. October 20th to 24th.

NATIONAL ASSOCIATION OF DENTAL FACULTIES. New Orleans. October 20th to 24th.

ASSOCIATION OF MILITARY SURGEONS. New Orleans. October 20th to 24th.

DELTA SIGMA DELTA FRATERNITY. New Orleans. October 20th.

PSI OMEGA FRATERNITY, GRAND CHAPTER AND NATIONAL ALUMNI CHAPTER. New Orleans. October 20th to 24th.

XI PSI PHI FRATERNITY. New Orleans. October 20th to 24th.

State Meetings.

MAY.

ARKANSAS STATE DENTAL SOCIETY. Pine Bluff. May 19th.

EASTERN ASSOCIATION OF GRADUATES OF THE ANGLE SCHOOL OF ORTHODONTIA. New York City. May 5th and 6th.

ILLINOIS STATE DENTAL ASSOCIATION. Peoria. May 13th to 16th.

INDIANA STATE DENTAL SOCIETY. Indianapolis. May 20th to 23d.

IOWA STATE DENTAL SOCIETY. Des Moines. May 6th to 8th.

MASSACHUSETTS STATE DENTAL SOCIETY. Boston. May 7th to 9th.

NEBRASKA STATE DENTAL SOCIETY. Omaha. May 20th to 22d.

ONTARIO DENTAL SOCIETY. Toronto. April 28th to May 1st.

PENNSYLVANIA STATE DENTAL SOCIETY. Pittsburgh. April 29th and 30th and May 1st.

SOUTH DAKOTA STATE DENTAL SOCIETY. Mitchell. May 1st to 3d.

JUNE.

CALIFORNIA STATE DENTAL ASSOCIATION. San Francisco. June 23d to 28th.

DENTAL SOCIETY OF THE STATE OF NEW YORK. Syracuse. June 12th to 14th.

FLORIDA STATE DENTAL SOCIETY. Tampa. June 18th to 20th.

GEORGIA STATE DENTAL SOCIETY. Savannah. June 11th to 13th.

KENTUCKY STATE DENTAL ASSOCIATION. Louisville. June 9th to 12th.

NEW HAMPSHIRE STATE DENTAL SOCIETY. Manchester. June 18th to 20th.

NORTHERN OHIO DENTAL ASSOCIATION. Cleveland. June 2d to 4th.

NORTH CAROLINA DENTAL SOCIETY. Asheville. June 25th to 27th.

SOUTH CAROLINA DENTAL ASSOCIATION. Columbia. June 19th to 21st.

JULY.

NEW JERSEY STATE DENTAL SOCIETY. Atlantic City. July 16th to 18th.

Examiners' Meetings.

ARKANSAS BOARD OF EXAMINERS. Little Rock. July 3d to 5th.

CALIFORNIA BOARD OF EXAMINERS. San Francisco, June 5th; Los Angeles, July 14th.

CONNECTICUT DENTAL COMMISSION. Hartford. June 19th to 21st.

ILLINOIS BOARD OF EXAMINERS. Chicago. June 23d to 28th.

IOWA BOARD OF EXAMINERS. Iowa City. June 18th.

KANSAS BOARD OF EXAMINERS. Topeka. June 23d to 27th.

MAINE BOARD OF DENTAL EXAMINERS. Augusta. July 1st.

MARYLAND BOARD OF EXAMINERS. Baltimore. June 10th and 11th.

MISSISSIPPI BOARD OF EXAMINERS. Jackson. June 17th.

* * * National Dental Association. * * *

IGNORANCE has been and is the deadliest enemy of civilization.

It has cost more lives, wrecked more homes, and shattered more happiness than all the wars conducted by all the tyrants since the beginning of time.

Only in modern times have men been able to develop a real defense against the terrific toll of human life. So far this defense has only been builded in small part. It will remain for the professional men of this and other countries to go on with the fight.

How many people in your community know the real value of the conservation of teeth or the effect of their decay on health?

Dentists must broaden the scope of dental education of the public which the war started.

The next meeting of the NATIONAL DENTAL ASSOCIATION will be held in New Orleans, La., October 20, 21, 22, 23, and 24, 1919.

C. V. VIGNES, *President*,

J. P. WAHL, *Chairman Local Committee*.

Examiners—Cont.

MISSOURI BOARD OF EXAMINERS. Jefferson City. June 9th to 11th.

NEW JERSEY BOARD OF REGISTRATION. Trenton. June 23d to 27th.

NORTH CAROLINA BOARD OF EXAMINERS. Asheville. June 23d.

PENNSYLVANIA BOARD OF DENTAL EXAMINERS. Philadelphia and Pittsburgh. June 23d to 26th.

RHODE ISLAND BOARD OF REGISTRATION. Providence. July 1st to 3d.

SOUTH CAROLINA BOARD OF EXAMINERS. Bamberg. June 30th.

SOUTH DAKOTA BOARD OF EXAMINERS. Sioux Falls. June 25th to 27th.

TENNESSEE BOARD OF EXAMINERS. Nashville. June 30th.

VERMONT BOARD OF EXAMINERS. Montpelier. June 30th and July 1st and 2d.

VIRGINIA BOARD OF EXAMINERS. Richmond. June 24th.

WASHINGTON STATE BOARD OF EXAMINERS. Seattle. May 22d to 27th.

South Dakota State Dental Society.

THE South Dakota State Dental Society will hold its thirty-seventh annual meeting at Mitchell, S. D., May 1, 2, and 3, 1919.

E. W. ELMEN, *Sec'y*, Sioux Falls, S. D.

[VOL. LXI.—30]

Ontario Dental Society.

THE Ontario Dental Society will hold its annual meeting in Toronto, Ont., Monday, Tuesday, Wednesday, and Thursday, April 28, 29, 30, and May 1, 1919.

J. E. RHIND, *President*,
Toronto, Ont.

J. A. BOTHWELL, *Sec'y*,
604 Spadina ave., Toronto.

Connecticut Dental Hygienists' Association.

THE fifth annual meeting will be held at Hotel Stratfield, Bridgeport, Conn., on Friday and Saturday, May 23 and 24, 1919. All interested in the work of the dental hygienist are most welcome.

(MISS) RUBY STEELE, *Sec'y*,
170 Main st., Bristol, Conn.

Eastern Association of Graduates of the Angle School.

THE Eastern Association of Graduates of the Angle School of Orthodontia will hold its tenth annual meeting at the Hotel Vanderbilt, New York City, N. Y., on Monday and Tuesday, May 5 and 6, 1919.

E. SANTLEY BUTLER, *Sec'y*,
576 Fifth ave., New York City.

Forsyth Dental Infirmary for Children.

PERMANENT STAFF APPOINTMENTS.

A COMPETITIVE examination of graduates in dentistry (of less than three years' standing) for appointments to positions on the permanent staff for full and one-half time service will be held early in June at the Infirmary.

Appointments will be made for one or two years as follows: Full-time service, requiring operating five and one-half days a week at a salary of \$1000 a year. Half-time service, requiring operating six half-days a week, either forenoon or afternoon, at a salary of \$500 a year.

These appointments will be made subject to satisfying the requirements of the Massachusetts State Board of Registration in Dentistry, and to "qualifying" in the practical work of the clinics during one month's trial.

Members of this staff are entitled to the advantages of reports and clinics by experts in the various branches of dentistry from different parts of the world, in addition to the numerous special and regular clinics and lectures. Operators after serving four months are eligible, by qualifying, for appointments in the special clinics where postgraduate work is given. The operators on this staff have the advantage of the clinics and lectures of the Postgraduate School of Orthodontia.

The Infirmary clinics provide unusual advantages in the various departments of the institution where operative dentistry, orthodontia, nose and throat and oral surgery, extracting, novocain technique, radiography, pathological diagnosis, and research work are continually carried on. The average number of cases treated daily in the various clinics is over 300. Supplies and necessary operating instruments are furnished; up-to-date apparatus, including electrical engines, sterile instrument trays, fountain cuspidors, compressed air, and the modern operating room type of laboratories are available for use.

A diploma of service will be issued by the trustees to each member of this staff who has completed this term of service in a satisfactory manner.

Applications for the above positions should be made not later than May 15th.

Information and the date of the examination will be furnished to those interested.

UNDERGRADUATE ASSISTANTS.

During the months of June, July, August, and September an opportunity is offered by the trustees of the Forsyth Dental Infirmary for Children to a limited number of undergraduate students to act as assistants in the clinics of the Infirmary. This privilege permits a student to obtain unusual clinical advantages in the various departments of the institution where operative dentistry, orthodontia, nose and throat and oral surgery, radiography, pathological diagnosis, and research work are continually carried on.

Operators' gowns, instruments, and filling materials are furnished. Over three hundred children are treated daily.

For further details apply before May 15th to the director.

DR. HAROLD DEW. CROSS.
140 The Fenway, Boston, Mass.

Illinois State Dental Society.

THE fifty-fifth annual meeting of the Illinois State Dental Society will be held in Peoria, Ill., May 13, 14, 15, and 16, 1919.

J. P. LUTHRINGER, *Sec'y*,
Peoria, Ill.

Pennsylvania State Dental Society.

THE fifty-first annual meeting of the Pennsylvania State Dental Society will be held at the William Penn Hotel, Pittsburgh, Pa., Tuesday, Wednesday, and Thursday, April 29, 30, and May 1, 1919. An interesting and instructive program has been prepared. All ethical practitioners are cordially invited to be present.

J. F. BIDDLE, *Sec'y*,
517 Arch st., Pittsburgh, Pa.

Psi Omega Fraternity.

NEW YORK ALUMNI CHAPTER.

THE twenty-seventh annual banquet of the Chapter will be held at the Hotel Commodore, 42d st. and Lexington ave., New York City, on Saturday, May 3, 1919, at 6.30 P.M. Every Psi Omega in this vicinity is cordially and fraternally invited to be present to help welcome those of our brothers who have been in the service. Send name and address to

JOHN L. PETERS, *Treasurer*,
133 W. 72d st., New York City.

Iowa State Dental Society.

THE annual meeting of the Iowa State Dental Society will be held in Des Moines, Iowa, May 6, 7, and 8, 1919. An interesting program has been arranged. Men from out of the state holding National cards are cordially invited to attend all sessions.

For further information address

E. R. SWANK, *Sec'y*,
C. N. B. Bldg., Des Moines, Iowa.

Kentucky State Dental Association.

JUBILEE MEETING.

THE fiftieth anniversary—"Jubilee meeting"—of the Kentucky State Dental Association will be held in Louisville, Ky., June 9, 10, 11, and 12, 1919.

A postgraduate course of unusual interest has been planned. Address all correspondence to

W. M. RANDALL, *Sec'y*,
Louisville, Ky.

California State Dental Association.

THE 1919 session of the California State Dental Association will be held at the University of California, San Francisco, Calif., June 23, 24, 25, 26, 27, and 28, 1919. The meeting will be conducted on the postgraduate plan. Members of other associations are invited providing their 1919 dues are paid, and that they shall pay the special fee for the course in which they may be interested. For further information address

J. E. GURLEY, *Sec'y*,
350 Post st., San Francisco, Calif.

Dental Alumni Society of the University of Pennsylvania.

THE annual meeting of the Dental Alumni Society of the University of Pennsylvania will be held on Friday, June 13, 1919.

The business meeting of the society will be held in the lecture room of Evans Institute, Fortieth and Spruce sts., at 10 A.M. An interesting series of clinics will be given in the clinic hall, at 2 P.M. The annual dinner of the society will be held at the Hotel Adelphia, at 6.30 P.M. There will be reunions of classes '99, '09, '14, and others.

For further information address

Z. T. JACKAWAY, *Sec'y and Treasurer*,
1506 E. Susquehanna ave., Philadelphia, Pa.

South Carolina Dental Association.

THE annual meeting of the South Carolina State Dental Association will be held on the campus of South Carolina University, Columbia, S. C., June 19 to 21, 1919.

G. A. MILNER, *President*,
ERNEST C. DYE, *Sec'y*,
Greenville, S. C.

Dental Society of the State of New York.

THE Dental Society of the State of New York will hold its fifty-first annual meeting June 12, 13, and 14, 1919, at the Hotel Onondaga, Syracuse, N. Y. All ethical dentists residents of New York and those residing in adjoining states are cordially invited to be present at the sessions of the society.

Dr. A. C. Bickelhaupt, City Bank Bldg., Syracuse, N. Y., is chairman of the Exhibits Committee.

A. P. BURKHART, *Sec'y*,
52 Genesee st., Auburn, N. Y.

Northwestern University Dental School.

ANNUAL HOMECOMING CLINIC.

THE annual Homecoming Clinic of the Northwestern University Dental School will be held June 16 and 17, 1919. A splendid program has been arranged for each day, covering subjects of vital interest in the practice of modern dentistry.

For information please communicate with the secretary of the Alumni Association.

M. M. PRINTZ,
25 E. Washington st., Chicago, Ill.

Northern Ohio Dental Association.

THE Northern Ohio Dental Association meeting will be held in Cleveland, Ohio, Monday, Tuesday, and Wednesday, June 2, 3, and 4, 1919, at the Hotel Statler.

In connection with the meeting a postgraduate course will be held from the 2d to the 6th, inclusive, consisting of the following: "Nerve-blocking Anesthesia." Dr. Arthur E. Smith of Chicago. "Attachments to Vital Teeth." Dr. Edward T. Tinker of Minneapolis. "Prosthesis." Dr. M. M. House of Indianapolis.

GEO. B. SMITH, *Sec'y*,
Fremont, Ohio.

North Carolina Dental Society.

THE North Carolina Dental Society will hold its next annual session June 25, 26, and 27, 1919, at Asheville, N. C. Headquarters Battery Park Hotel.

W. T. MARTIN, *Sec'y*,
Benson, S. C.

New Jersey State Dental Society.

THE forty-ninth annual convention of the New Jersey State Dental Society will be held on July 16, 17, and 18, 1919, on Young's Million Dollar Pier, Atlantic City, N. J.

The entire convention will be held on the pier. Machinery Hall will be used for the exhibits. Those who attended last year will remember the magnificent display of dental goods, and Dr. W. W. Hodges of Perth Amboy, N. J., chairman of the Exhibit Committee, with 25,000 square feet of space, has promised an exhibit greater than that of 1918. Dr. Angelo Zabriskie of Ridgewood, N. J., as chairman of the Clinic Committee, has arranged for a program of clinics that will prove of great interest.

The Essay Committee under the direction of Dr. Edward L. Wharton of Newark, will present essayists of prominence—names and subjects to be announced.

All meetings for the presentation of papers as well as the business meetings will be held in the Greek Temple, out on the pier.

The headquarters of the society will be at the pier entrance. Mail may be directed to exhibitors, clinicians, or members, in care of the Secretary New Jersey State Dental Society, Young's Million Dollar Pier.

A list of hotels where special rates may be secured will be published in the *New Jersey Dental Journal* prior to the convention, or may be secured by addressing the secretary.

A cordial invitation is extended to ethical practitioners.

JOHN C. FORSYTH, *Sec'y*,
430 E. State st., Trenton, N. J.

Susquehanna Dental Association of Pennsylvania.

THE fifty-fifth annual meeting of the Susquehanna Dental Association will be held at Hotel Casey, Scranton, Pa., October 8, 9, and 10, 1919.

As the members of the association all remember, this meeting was to have been held at the same time and place last fall, but on account of the influenza epidemic it had to be canceled, and it is now being held in October in order that it will not interfere in any way with the attendance at the meeting of the state dental society at Pittsburgh in April.

The executive committee are working out plans to make this the best meeting in the history of the association. It is going to be one of those good old-fashioned meetings that no one can afford to miss.

Further details will follow, but we give you this friendly little tip now that it is going to be somewhat along the postgraduate line, some of the biggest men in the profession having already been retained for the three days.

Watch for further details, and begin to plan to lock up your office for the whole session. We will make it well worth the trip.

J. P. COULT,
E. L. BROWN,
J. B. TWEEDLE,
Committee.

George Washington University, Department of Dentistry.

THE student body of the George Washington University Dental Department has organized a society termed The George Washington University Student Dental Society, the object of which is to stimulate more interest in the student body in matters pertaining to dentistry.

The following officers were chosen: B. E. Erikson, president; R. L. Morrison, secretary-treasurer.

The constitution provides that the senior class be divided into groups, one of which prepares a paper, with demonstrations, to be read at each monthly meeting. The first meeting was held on February 25th, at which time a paper was read on "The Making of Gold Inlays by the Indirect Method," followed by a demonstration of the method.

There was a very interesting discussion of the paper, which convinced those present that the society is sure to be a success and a benefit to all the student body.

R. L. MORRISON, *Sec'y-Treas.*,
1335 H st., N. W., Washington, D. C.

Forsyth Training School for Dental Hygienists.

ALUMNÆ ASSOCIATION.

A MEETING of the Forsyth Dental Hygienists' Alumnæ Association was held April 1, 1919, at the Forsyth Dental Infirmary, Boston, Mass. Dr. Alfred C. Fones of Bridgeport, Conn., spoke on "The Field of Service of the Dental Hygienist." Dr. Thomas Forsyth presented the alumnæ with a beautiful banner.

A. E. CHRISTIE, *Sec'y*,
Boston, Mass.

Washington State Board of Examiners.

THE next meeting of the Washington State Board of Dental Examiners will be held in Seattle, Wash., May 22 to 27, 1919.

FRANK B. LYNOTT, *Sec'y*,
249 Peyton Blk., Spokane, Wash.

Iowa Board of Examiners.

THE next meeting of the Iowa Board of Dental Examiners for the examination of candidates for licenses will be held in Iowa City, at the College of Dentistry, commencing Wednesday, June 18, 1919, at 9 A.M.

For application blank and information address

J. A. WEST, *Sec'y*,
805 Pleasant st., Des Moines, Iowa.

California Board of Examiners.

THE next meeting of the Board of Dental Examiners of California for the purpose of examining applicants for a license to practice dentistry in that state will be held in the city of San Francisco beginning on the 5th day of June 1919, at 9.30 A.M. This examination will be followed by an examination to be held in the city of Los Angeles, beginning on the 14th day of July 1919, at 9.30 A.M. Each applicant shall file with the secretary of the board at least ten days before the date selected for each examination, the following credentials: (1) Diploma or certificate of graduation from a reputable dental college approved by the board. (2) A diploma from an accredited high school or a certificate signed by a state superintendent of public instruction (or similar officer) to the effect that the applicant has had scholastic prepa-

ration equivalent in all respects to that demanded for graduation from a high school giving a four-year course of instruction. An applicant who has been a licensed practitioner of dentistry of some other state of the United States for a period of at least five years shall file such license or licenses, which will be accepted in lieu of high-school credentials. (3) Testimonial of good moral character. (4) A recent unmounted photograph of the applicant.

For further information, address

C. A. HERRICK, *Sec'y*,
133 Geary st., San Francisco, Cal.

South Carolina Board of Examiners.

NOTE CHANGE OF DATE.

THE next meeting of the South Carolina State Board of Dental Examiners will be held at Bamberg, S. C., commencing promptly at 9 o'clock, Monday morning, June 30, 1919. All applications should be in the hands of the secretary by June 20th.

Application blanks and further information may be obtained by addressing

R. L. SPENCER, *Sec'y*,
Bennettsville, S. C.

Connecticut Dental Commission.

THE Connecticut Dental Commission will meet at Hartford, June 19, 20, and 21, 1919, to examine applicants for license to practice dentistry, to examine applicants for dental hygienist's license, and to transact any other business proper to come before said Commission.

For further information, address

EDWARD EBERLE, *Recorder*,
902 Main st., Hartford, Conn.

Kansas Board of Examiners.

THE next meeting of Kansas Board of Dental Examiners for the examination of candidates to practice dentistry in Kansas will be held at the National Hotel, Topeka, Kans., beginning June 23d at 7.30 P.M., and lasting through the 27th. The fee is \$25. For application blank and other information address the secretary.

J. FREMONT, *President*,
Kingman, Kans.
F. O. HETRICK, *Sec'y*,
Ottawa, Kans.

Maryland Board of Examiners.

THE Maryland Board of Dental Examiners will meet for examination of candidates for certificates on June 10 and 11, 1919, in Baltimore, at the dental department of the University of Maryland, at 9 A.M.

For application blanks and further information apply to

F. F. DREW, *Sec'y*,
701 N. Howard st., Baltimore, Md.

South Dakota Board of Examiners.

THE next meeting of the South Dakota State Board of Dental Examiners will be held in Sioux Falls, S. D., June 25, 26, and 27, 1919, beginning promptly at 9 A.M. June 25th.

All applications must be in the hands of the secretary by June 20th. Fee for examination \$25.00. No reciprocity or interchange. Address

L. S. SPENCER, *Sec'y*,
Watertown, S. D.

Mississippi Board of Examiners.

THE next meeting of the Mississippi State Board of Dental Examiners will be held in the Capitol Building, Jackson, Miss., on the third Tuesday in June. Examinations begin at 8.30 A.M. daily until completion. Fee \$10. Diploma from recognized school and certificate of moral character required. Application blanks and further information can be obtained from

B. J. MARSHALL, *Sec'y*,
6-7 Turner-Cox Bldg., Marks, Miss.

Missouri Board of Examiners.

THE Missouri Dental Board will hold their regular examination for examining applicants to practice dentistry in Missouri at Jefferson City, on Monday, Tuesday, and Wednesday, June 9, 10, and 11, 1919, beginning at 8 A.M. on Monday.

The practical examination will also be given at the Kansas City college on Monday and Tuesday, May 5th and 6th, and at the St. Louis college on Friday and Saturday June 6th and 7th.

It is much more convenient for the applicants to take the practical examination at the colleges. The practical examination will also be given at Jefferson City.

V. R. McCUE, *Sec'y*,
Cameron, Mo.

Illinois Board of Registration.

THE next meeting of the Committee of Dental Examiners for the examination of applicants for licenses to practice dentistry in Illinois will be held in Chicago, the week commencing Monday, June 23d. For application and further information, address the Department of Registration and Education, Springfield, Ill.

E. C. DODDS, *Sup't of Registration*.

New Jersey Board of Registration.

THE State Board of Registration and Examination in Dentistry of New Jersey will hold their regular examination in the Statehouse, Trenton, N. J., June 23d to 27th. License fee, \$25, re-examination fee, \$10. Practical tests required: Insertion of an approximal gold filling with approximating tooth in position, compound approximal amalgam filling, a silicate filling, practical test of applicant's ability in oral prophylaxis, and preparation of cavity for an inlay with wax pattern. Also the soldering of a bridge consisting of three or more teeth exclusive of abutments, and one Richmond crown, which may be one of the abutments of the bridge; these must be struck from dies made from an impression of the mouth, and the articulating model, with the bridge, when soldered, must be submitted for inspection. An anatomical articulation of a full upper and lower set of teeth will also be required; teeth to be furnished by applicant. Wax bite properly trimmed and in place on models for inspection before setting up teeth.

Attention is directed to the following quotation from the dental law of New Jersey:

"Applicant shall present to said board a certificate from the Commissioner of Education of this state, showing that before entering a dental college he or she had obtained an academic education consisting of a four-year course of study in an approved public or private high school, or the equivalent thereof." In accordance with this law the secretary will issue application blanks only upon presentation of the required certificate from the Commissioner of Education, Statehouse, Trenton, N. J.

Note: Dental Radiography will be added to the list of theoretical examinations in June 1919.

Applications must be filed complete ten

days before the date of the examinations. Address all communications for further particulars to the secretary (as below).

DECEMBER EXAMINATIONS.

The December examinations of the State Board of Registration and Examination in Dentistry of New Jersey will be held for five days commencing the first Monday in the month. And at that time the theoretical prosthetic and the present practical prosthetic examinations will be dispensed with, and in place thereof a practical prosthetic examination will be given as follows: Taking of impression; bite; selection of teeth, articulation, trial plate. Soldering of Richmond crown, which must be made from an impression of the mouth, and the articulating model with the crown, when soldered, must be submitted for inspection. Oral theoretical examination to be given at the chair. The theoretical examination in Metallurgy will be merged with Chemistry and will consist of five questions. A practical examination in Mouth Diagnosis will be added to the requirements.

JOHN C. FORSYTH, *Sec'y*,
430 E. State st., Trenton, N. J.

Virginia Board of Examiners.

THE next meeting of the Virginia State Board of Dental Examiners will be held in Richmond, Va., beginning at 9 o'clock on Tuesday morning, June 24, 1919.

For further information and application blanks address

J. LEWIS WALKER, *Sec'y*,
505 Taylor Bldg., Norfolk, Va.

Vermont Board of Examiners.

THE next meeting of the Vermont Board of Dental Examiners, for the examination of candidates to practice in Vermont, will be held at the State-house, Montpelier, commencing at 2 P.M. on June 30, 1919, and continuing for three days.

To be eligible for examinations a candidate must be (1) twenty-one years of age, (2) a graduate of a high school of first class, and (3) a graduate of a reputable dental college.

Applications must be in the hands of the secretary not later than June 21st.

For further information apply to

HARRY F. HAMILTON, *Sec'y*,
Newport, Vt.

North Carolina Board of Examiners.

THE next meeting of the North Carolina State Board of Dental Examiners will be held at Asheville, N. C., beginning promptly at 9 o'clock on Monday morning, June 23, 1919.

For further information and application blank address

F. L. HUNT, *Sec'y*,
Asheville, N. C.

Pennsylvania Board of Examiners.

THE next examination by the Pennsylvania Board of Dental Examiners will be held in Philadelphia and Pittsburgh on Monday, Tuesday, Wednesday, and Thursday, June 23, 24, 25, and 26, 1919. The practical examination will be held on Monday, June 23d, the first day, in the University of Pittsburgh Dental School in Pittsburgh, and the Evans Institute, University of Pennsylvania, Philadelphia. The operative examination will be held at 8.30 A.M. and the prosthetic examination at 1.30 P.M. The theoretical examination will be held at the College of Pharmacy, in Pittsburgh, and at Musical Fund Hall, Philadelphia.

Application papers can be secured from the department of Public Instruction, Harrisburg. For further information address

ALEXANDER H. REYNOLDS, *Sec'y*,
4630 Chester ave., Philadelphia.

Maine Board of Examiners.

THE Maine Board of Dental Examiners will meet at the State-house, Augusta, for its next regular examination, beginning July 1, at 8.30 A.M.

All applications and fee of \$20 must be in the hands of the secretary by June 21st.

The examination for dental hygienists will be given at the same time; fee \$10.

WILL S. PAYSON, *Sec'y*,
Castine, Me.

Arkansas Board of Examiners.

THE Arkansas State Board of Dental Examiners will hold their examinations at Hotel Marion, Little Rock, Ark., July 3, 4, and 5, 1919. All applications must be in the hands of the secretary on or before June 23d. Examination fee \$15. For further information and application blanks address

H. J. GREEN, *Sec'y*,
Paragould, Ark.

Rhode Island Board of Registration.

THE regular semi-annual meeting of the Rhode Island Board of Registration in Dentistry for the examination of applicants will be held in the State-house, Providence, R. I., July 1, 2, and 3, 1919. All applications with proper fee must be filed one week previous. For further information address

ERNEST A. CHARBONNEL, *Sec'y*,
334 Westminster st., Providence, R. I.

New York State Examinations in Dentistry.

POSTPONEMENT OF EXAMINATIONS BY ACTION OF THE BOARD OF REGENTS.

BECAUSE of the interference with the course of instruction, caused by the emergent inauguration of the Students Army Training-corps in connection with dental schools,

it has been found that in many cases it is necessary to extend the course of instruction in the schools, for the current senior year, to a period beyond the regular date of graduation, many of the schools being obliged to lengthen the course to July 15th and some to a date as late as July 31st.

To the end that there may be no hardship to students thus graduating after the date of our regular June dental examination, it has been formally decided by the Board of Regents to postpone the June dental examination until the first Tuesday of September, and the September examination until the second Tuesday of November.

There will therefore be no June dental examination held in this state in 1919, but this will not affect examinations in subsequent years.

AUGUSTUS S. DOWNING,
Assistant Commissioner of Education.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING FEBRUARY 1919.

February 4.

- No. 1,293,358, to JAMES S. DAVIDSON. Dental laboratory instrument.
- No. 1,293,567, to FREDERICK L. STANTON. System of dental charts and method of making the same.
- No. 1,293,627, to FREDERICK U. BOWERS. Artificial denture.
- No. 124,291, to HERMAN R. BROWN. Trade-mark for toothpowder and germicide for the treatment of the gums and teeth.
- No. 52,957, to JAMES H. HURTT, JR. Design for chemist's mortar.

February 11.

- No. 1,293,950, to WILLIAM F. SHAW. Clasp for plates or removable bridges.
- No. 1,293,998, to FRANK G. WAGNER. Attachment for dental engines.

- No. 1,294,355, to HORATIO A. BLACK. Dental filling and process of making same.
- No. 14,589, to ALBA C. BOOTH. Reissue: Toothbrush.
- No. 124,382, to HARMS WRASSE CO. Trade-mark: Preparation for the treatment of pyorrhea and kindred diseases.

February 18.

- No. 1,294,423, to CHARLES H. DAVIS. Dental tool.

February 25.

- No. 1,295,244, to HENRY J. WARREN. Method of constructing and connecting artificial teeth.
- No. 124,546, to FRANK M. JOHNSON. Trade-mark for dental cream, or toothpaste for cleaning teeth, sterilizing the mouth, and destroying bacteria.
- No. 124,590, to SHERWIN SHAPIRA CORPORATION. Trade-mark for toothpowder.



DR. WM. RABUN CHAPLIN.

THE DENTAL COSMOS

VOL. LXI.

JUNE 1919.

No. 6

ORIGINAL COMMUNICATIONS

A Removable Retainer.

By C. A. HAWLEY, D.D.S., Washington, D. C.

(Read before the Eastern Association of Graduates of Angle's School of Orthodontia, Baltimore, Md., March 29, 1919.)

ONE of the great unsolved problems of orthodontia has been, and is today, RETENTION.

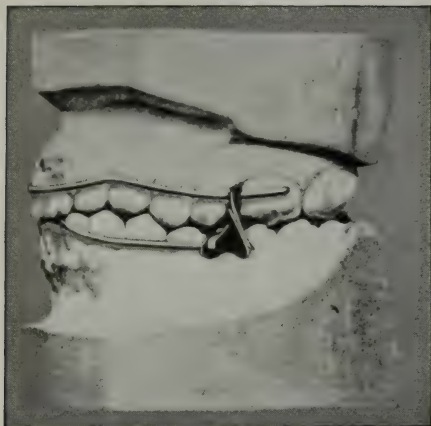
About twelve or fifteen years ago one of my good friends who had been struggling with the difficulties of retention for several years said to me, "If anyone would take my cases when they are finished, retain them and be responsible for them afterward, I would gladly give him half the fee." This declaration came to me as a great shock and made a deep impression on my mind. Later I have often heard the expression, "Any fool can move teeth, but it takes a wise man to make them stay."

These expressions I think fairly represent the feeling of orthodontists today toward retention. Why should teeth not stay in place when moved to the proper position? Page after page, paper after paper, has been written to show why they do not, and the problem is still unsolved. I think that our mistake has been that to this unsolved and undeter-

mined factor we have been applying a determined but guessed-at solution. That is, while the length of the period for which any case needs to be retained is admitted to be unknown, and the length of time that period varies in different cases is unknown, we have been arbitrarily fixing that time, with results which too often are a tragedy. We work long and faithfully to place teeth in correct occlusion. We apply a fixed retention, and at the end of a certain period—one year, two years, or longer as the case may be—we remove the retention. In a large per cent. of cases the teeth do not stay. They may not go back to the original positions, but the condition after a few years is unsatisfactory. If again taken up and corrected, the same unsolved factor in retention presents and no more assurance of success can be given than before. Why not approach this problem from another angle, and adapt our retention to the conditions that we know are present? This can only be

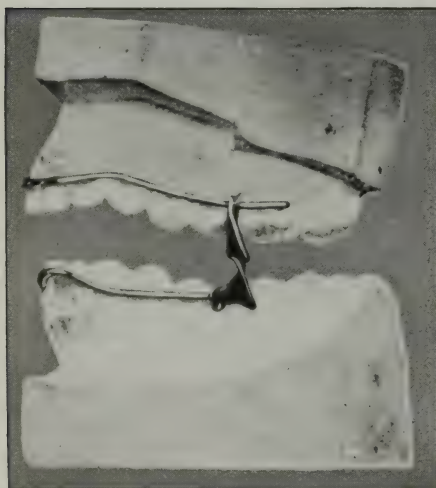
done with a removable retainer, and I wish to present to you one which promises to fulfil these requirements.

FIG. 1.



My first ideas of the retainer were gained from Dr. R. D. McBride of Dresden, Germany, while visiting his office in 1906. He had been using a

FIG. 2.



form of retainer for several years which embodied certain basic principles the value of which impressed me very strongly.

This device consisted originally of a rubber roof-plate with heavy flat bars of metal passing between the first molars and the second bicuspid to the buccal

FIG. 3.

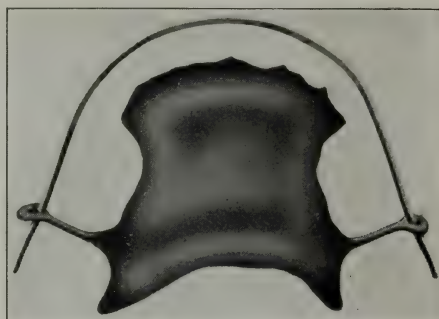


FIG. 4.



FIG. 5.



surface. These bars on the buccal surface were fashioned into planes which slid back of similar planes on the lower apparatus for the purpose of holding the proper mesio-distal relation of the two

jaws. A piece of No. 17 gage round wire extended around the outside of the arch in contact with the labial and buccal surfaces of the teeth, and was fastened at either end to the bars which passed between the teeth as previously mentioned. (Figs. 1 to 5.) He used also, in some cases, instead of a roof-plate, a very heavy wire bent to the lingual surfaces of the teeth as shown in the illustrations.

The use of the retainer as made by Dr. McBride was not very successful in my hands, yet I have considered the principles upon which it was based so promising that I have persisted in its limited use and study since that time. One after another the most objectionable

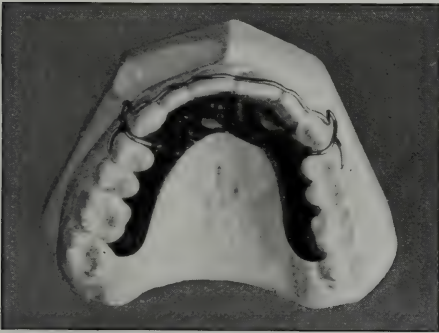
use of the retainer which will be described later.

Second, the side planes for holding the mesio-distal relation I found successful in only a few cases. With our present understanding and practice I think they are wholly unnecessary.

FIG. 7.



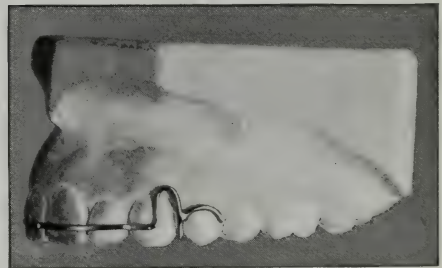
FIG. 6.



Third, the labial wire was too heavy and had too long an extension without supports.

The retainer as I am now using it consists of a skeleton plate fitting accurately the lingual surfaces of the teeth. From the plate, back to the cuspids,

FIG. 8.



features have been eliminated, until I now have great confidence in its practicability, and have used this retainer almost to the exclusion of everything else for a couple of years.

It is hardly necessary to enumerate the obviously objectionable features of this original appliance, yet it might not be out of place to mention some of them.

First, the wide spaces necessary between the first molars and second bicuspid were often troublesome. Food often became packed in a pocket under the bar, and often the bar was pushed down farther than intended through the breaking or displacement of the stops. Then, if the appliance was left out a few days the spaces would close. This possibility prevented a most important final

where there are always spaces even in closely occluding dentures, passes a No. 19 gage gold wire, which is formed into loops, and between them, passing over the labial surfaces of the incisors, is a flat wire .022 x .036. Attached to and extending backward from the No. 19 gage wire is a bicuspid clasp. (Figs. 6, 7, and 8.) On the lower a wire hook is

embedded in the plate and passes between the lingual cusps of the first molar over the margin of the tooth to keep the plate from being pressed down at the heels. (Fig. 9.)

FIG. 9.



If it is desired to correct or hold the overbite, a flat ledge is built on the upper plate. This can be extended into a bite-plane to assist in correcting or holding the mesio-distal relation where it is needed. (Fig. 10.)

FIG. 10.



There are four important movements that must be provided against in retention:

First: The expansion and form of the arch.

Second: The rotated teeth must be

prevented from returning to their former positions.

Third: The mesio-distal relation must be maintained.

Fourth: The overbite must be established.

As for the first essential, the holding of the expansion and form of the arch, the efficiency of a plate needs little comment. It is one of the oldest and most reliable means used for that purpose.

As for the second, the retention of rotated teeth, the possibility of this method most aroused my interest in Dr. McBride's appliance, and I might say my skepticism as well. However, I may say that I am now succeeding better in holding such teeth by this method than I have by bands or spurs or any other method I have ever employed. By glancing again at this device (Fig. 6), it will be seen that in order to rotate, a tooth must lift away from the plate, which closely fits the palatal surface. This the labial wire prevents it from doing. If a tooth is seen to start in this movement the wire may be made to press harder at this point; the tooth will return to place and the movement will be stopped. The question might naturally arise why the device succeeds, while lingual and labial wires combined, soldered to cemented cuspid bands, are generally a failure in preventing incisor teeth from rotating. The reason probably is that no wire has been made to fit the lingual surfaces as accurately as does the plate, and would not be safe from injuring the tooth, if it were not removable, even though it were so fitted. Also the labial wire in such a cemented device has not the same elasticity or adjustability.

There are some exceptions to be made to the teeth that may be held from rotation with this retainer. Round, or commonly called peg-shaped, lateral incisors or lower bicuspid, for obvious reasons, cannot be retained by this means. For these I use a cemented band with a flat vertical bar attached, which fits into a slot in the plate. (Fig. 11.) To hold the second bicuspid when rotated it is necessary to extend the bicuspid clasp over these teeth. (Fig. 12.)

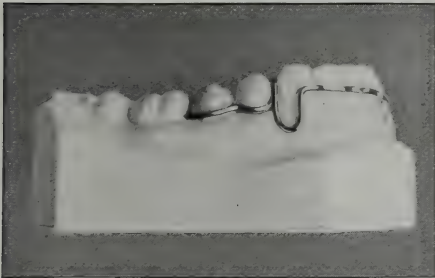
As for the third, the mesio-distal relation: This has been one of the most troublesome problems in the development of this retainer. The use of intermaxillary rubbers with a removable fixture is impossible unless some bands are used to make it semi-fixed, and these bands seriously detract from the perfection of the retainer. However, I have found that if

FIG. 11.



the arches are so harmonized that the forward and proper occlusion is the only comfortable one for the patient, with all interfering cusp relations corrected, and with the help of muscle exercises as developed by Dr. Rogers, we shall have very little if any need of former methods of retaining this relation. In extreme cases, as previously mentioned, the old

FIG. 12.



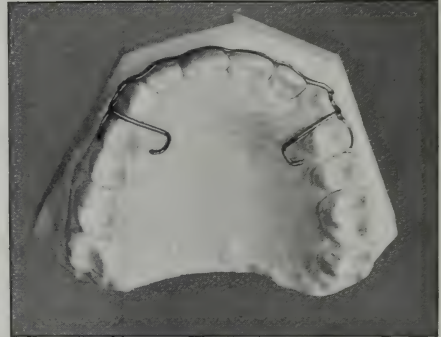
form of bite-plane can be constructed on this plate and gradually removed as it is found to be no longer needed.

Fourth, the overbite is retained and can be corrected by building on the plate a flat or slightly inclined shelf back of the incisors.

The method of construction is very simple. The wire framework is made on a model of plaster or artificial stone. (Fig. 13.) These I have bent by hand

with bending pliers. The wire embedded in the plate and up to the ends of the loops is No. 19 gage clasp gold or Ney's E wire. The portion from this point passing over the labial surfaces of the incisor teeth is flat or ribbon wire .022 x .036, the size of Angle's ribbon arch wire. I prefer Ney's E wire for this

FIG. 13.



also. The union is made with 18-karat solder. The flat wire is slightly festooned to fit the labial surfaces of these teeth. Extending backward from the loop is a bicuspid clasp, soldered to the loop. This is No. 19 gage E wire. The convex form shown in the illustration has been very successful. It is important that it should

FIG. 14.



pass over the bulge of the bicuspid with some spring and lie at rest, without tension, near the gum line. After the framework is finished the plate is waxed up and vulcanized.

It is essential that the rubber plate should be as tough and springy as possible. The waxing should be accurately done without surplus and vulcanized between two sheets of No. 60 tin foil. The

plate, where it comes in contact with the lingual surfaces of the bicuspid and molars, should be thin so as to spring over their convex lingual surfaces and thus assist as much as possible in holding the plate in position. (Fig. 14.) The use of a rugæ pack to reproduce the natural rugæ of the mouth adds materially to the comfort of the plate.

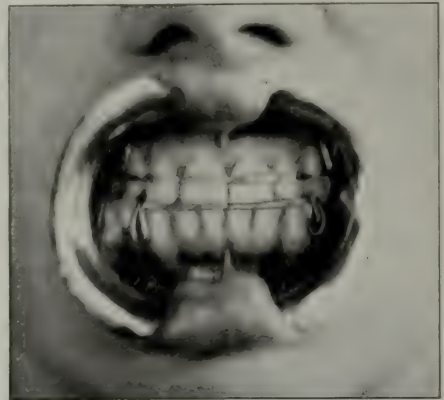
After making ten gold plates, both cast and swaged, I have abandoned them altogether and replaced every one with rubber plates. They were preferred by the patients on account of the lightness, and by myself, on account of the greater simplicity of construction and ease of changing the part in contact with the tooth. One idea that I had was that the wires when broken could be mended more easily in the case of the gold plate, but I find that by using a strip of wet cotton in contact with the rubber held with a pair of pliers, the wires can usually be mended successfully on the rubber plate.

My scheme for the use of the retainers is as follows: They are only used when the denture is complete, that is, when there are no deciduous teeth remaining in the mouth. When the case is ready for retention, I take the impressions, make the plates, and fit them carefully in the mouth, adjusting the labial wire so that it is in contact with each tooth. A piece of floss silk passed between the wire and the teeth will help to determine this fact. The patient is instructed to wear them constantly, removing them only for cleaning and, if necessary, while eating. They should be examined in a few days or a week, and any small adjustments made that are necessary. They are worn constantly for from two to six months, during which time they should be occasionally examined. If during this time the patient wishes to remove them for a few hours for some special engagement, it can be done without harm. After this period, I have found that wearing them at night only is sufficient. Prophylaxis treatment or filling operations can of course be done without interference at any period of the retention. It will be understood that if there is a bite-plane, its work must be

finished and the molars and bicuspid must be in close occlusion before the constant wearing is abandoned.

After they have been worn at night for about a year they can be left out for several days or a week, and then tried in. If they bind or go in with difficulty, it is evident that the teeth are changing and the nightly use must be resumed. The patient can thus keep the plates for years as a check against retrograde movement, and we have a provision for the different lengths of time for which different cases need retention. This important

FIG. 15.



feature could not be utilized in Dr. McBride's retainer, on account of the closing of the spaces between the first molars and second bicuspid. In some cases of patients going to foreign countries I have two sets made, the second set to be used in case of loss or breakage of the first.

The appearance in the mouth is not displeasing (Fig. 15)—in fact, much less so than in most fixed retentions. Where teeth are missing from any cause they can be satisfactorily supplied during retention by attaching to the plates.

A considerable amount of movement can be accomplished with this retainer. Either arch can be expanded to a small degree by heating in the center, stretching, and then cooling in that position. The position of a tooth that is labial to the proper line can be corrected by cut-

ting back the plate with a small stone, being careful, however, to preserve the form of the lingual surface, then adjusting the labial wire to press upon the tooth. Teeth that are slightly lingual can be moved out by cutting a recess in the plate and building on cement, amalgam, or fusible metal. Thus if, in an emergency, it is necessary to retain teeth before they are quite in a satisfactory position, it can be done, and the final movement accomplished later.

If the teeth are in place at the time the impression is taken, no fear need be experienced for the slight movement that will take place during the few days that elapse while the retainer is being made.

Wearing the retainer a day or two will bring the teeth back to the positions they occupied when the impression was taken.

In conclusion I wish to say that no claim whatever is made in this retainer for originality or invention. It is a new adaptation of some of the oldest ideas in orthodontia. Its development has consumed considerable time and thought, but the relief from the uncertainties of fixed retention in my own practice has been ample compensation. I have no idea that it is perfect or cannot be improved, but am offering it to the society with the hope that many helpful suggestions will be made.

1624 "I" st., N. W.

Treatment of Ununited Fractures of the Jaws:

RÉSUMÉ OF WORK DONE BY

Dental Department, U. S. Army Gen. Hosp. No. 11, Cape May, N. J.

By First Lieut. D. H. MCCAULEY, D.C., U. S. A., Laurel, Mont.,

CHIEF DENTAL SURGEON

AND

First Lieut. B. L. WORTHLEY, D.C., U. S. A., Kansas City, Mo.,

ASSOCIATE.

(Continued from page 407.)

(II.)

CASE V. Wounded April 18, 1918, by shrapnel, in the Lorraine sector, nearly the entire face being torn from right side and thrown to left, comminuting the nose and both maxillæ. Except for the right and left third molars, all teeth of the upper jaw, together with the underlying bone, were destroyed.

Patient was taken to a French hospital, where a remarkable plastic operation was performed for the restoration of the soft parts. A prosthesis was then

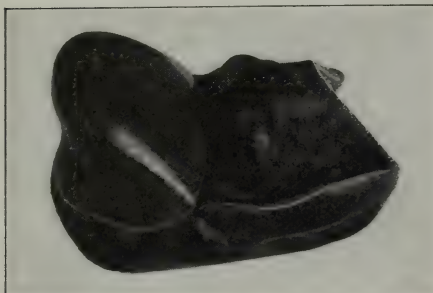
made which extended from the mouth into the nose and held the soft parts in position during healing and contraction.

Arrived at U. S. A. Gen. Hosp. No. 11, September 1st, with a defect in the hard palate 3 cm. in diameter, the prosthesis preventing further closure. The prosthesis was removed, and another was made which came to the opening but did not enter it. Healing then proceeded rapidly, and by January 1, 1919, the

opening was reduced to one-fifth its size. Patient refused operation for closure of this defect, so a vulcanite prosthesis was made, January 20, 1919, and patient was discharged February 1, 1919. He can masticate very well.

(See Figs. 27 to 35.)

FIG. 27.



Prosthesis worn by patient on arrival. The oval projection extended through the roof of the mouth into the anterior nasal cavity.

CASE VI. Received wound by machine-gun bullet July 18, 1918. Bullet entered the right side of the upper lip and passed through the right side of the neck about $1\frac{1}{2}$ in. below the angle of the jaw. Wounded about 12 M., remaining

FIG. 28.

FIG. 29.

FIG. 30.

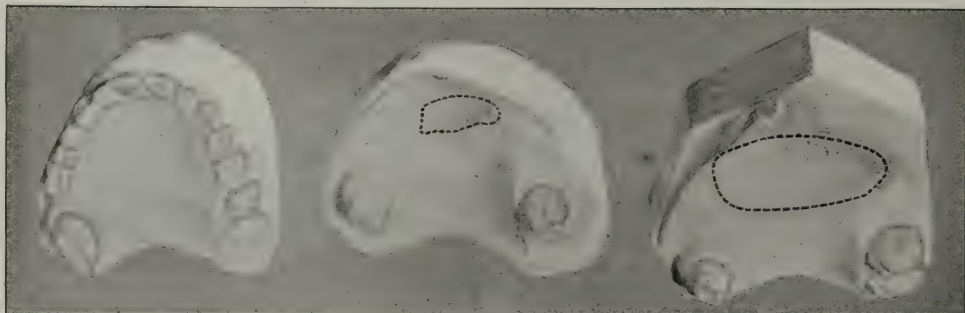


FIG. 28: February 1, 1919. Prosthesis in place.

FIG. 29: January 1, 1919. Same case.

FIG. 30: September 1, 1918. (Shows size of cavity on arrival.)

on battlefield until next morning about 4 A.M., before being removed to first aid station, where he remained all day. He

was then removed to French receiving station, kept there about two hours, then

FIG. 31.



Profile of patient before the last prosthesis was inserted.

removed to an American hospital in France, remaining there about ten days.

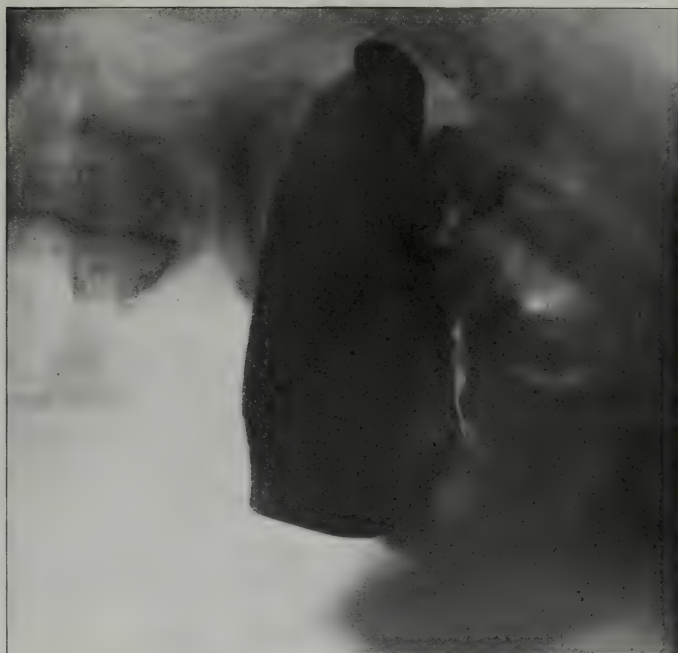
While in the American hospital he was placed under ether and the teeth wired up with silver wire. He was next re-

FIG. 32.



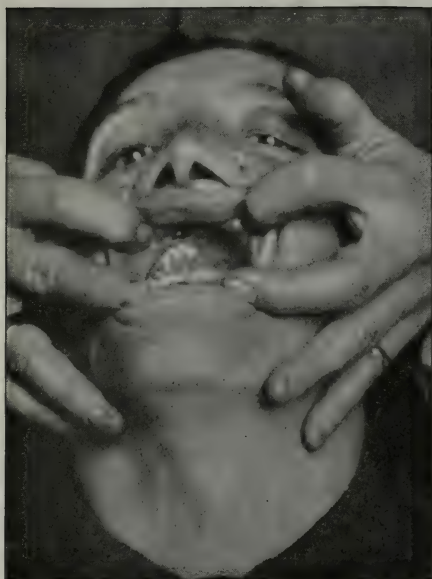
Note destruction of maxilla without prosthesis in place.

FIG. 33.



Shows the large amount of bone destruction. The large black object is his prosthesis. Taken February 1, 1919.

FIG. 34.



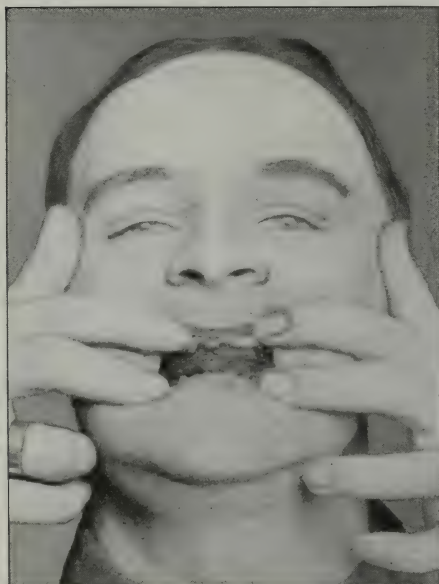
Size of opening. February 1, 1919.

FIG. 35.



Case completed. February 1, 1919.

FIG. 36.



The old type of interdental swaged nickel silver splint in place.

FIG. 37.



Shows how wide the patient could open his jaws two days after lower splint had been removed; the jaws having been rigid for four months.

moved to Base Hosp. No. 8 and remained there about five weeks; here the wires were removed and splint inserted. He was then removed to Base Hosp. No. 5, and after remaining there three days set sail.

Arrived at U. S. A. Gen. Hosp. No. 11, Cape May, N. J., September 27, 1918. Splints being loose were removed; the fragments were freely movable; fetid

All of patient's teeth destroyed were replaced, and patient given a thirty-days' furlough before being discharged.

(See Figs. 36 to 40.)

CASE VII. Wounded at Chateau-Thierry August 6, 1918. Shrapnel entered face at left angle of the mouth passing downward and backward. Shrapnel measured two inches wide, $\frac{1}{2}$ in. thick

FIG. 38.



Note occlusion of teeth after removal of splint, February 20, 1919.

odor; sinus in mouth in the region of fracture exuded yellowish pus. X-ray showed large sequestrum of bone, loss of 3 cm. of bone substance and of all teeth on lower right side from lower right first bicuspid. Another interdental swaged nickel silver splint was inserted holding the jaws 5 mm. apart. Patient was seen three times daily for one month.

October 10, 1918, a large spicule of bone was removed from fracture measuring 3 cm. by 1 cm. October 25, 1918: Sinus healed. February 15, 1919, splints were removed; union perfect, no trismus present.

and 3 in. long. This was removed August 7, 1918, and weighed over 4 oz.

On the left side of the mandible all the teeth were destroyed and bone comminuted. Jaws were wired together on right side. Operated on by Major Blair September 7, 1918, several fragments of jaw being removed.

Arrived at U. S. A. Gen. Hosp. No. 11, October 10, 1918. Two sinuses draining from lower border of the mandible. Upper and lower splints were inserted and on the lower splint was a saddle attachment to hold fragments of left jaw in alignment. There was also

FIG. 39.



Sequestrum in place. September 20, 1918.

FIG. 40.

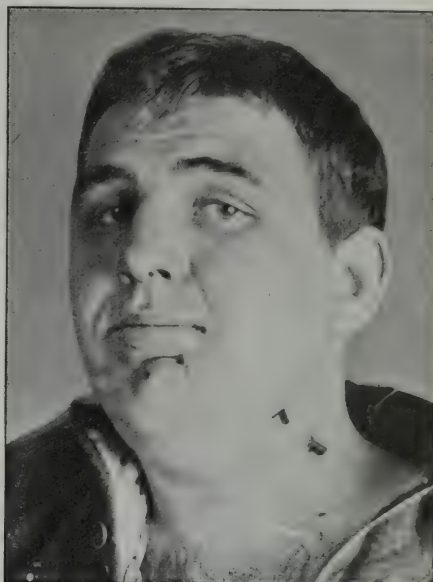


Shows new bone formation, February 14, 1919, after removal of sequestrum four months previously. Arrows point to bone formation.

FIG. 41.



FIG. 42.



FIGS. 41 AND 42: Illustrate method used in applying Dakin solution. Note scar at left angle of mouth; entrance of shell fragment. Tube shows where fragment lodged and was later removed. Photograph October 28, 1918.

FIG. 43.



Shell fragment removed from patient. Actual size. Weight 4 oz.

an inclined plane on the right side to prevent lateral movement.

This case was very difficult to treat, owing to the fact that the left side of the

FIG. 45.



Shows filling in of bone. January 9, 1919.

FIG. 44.



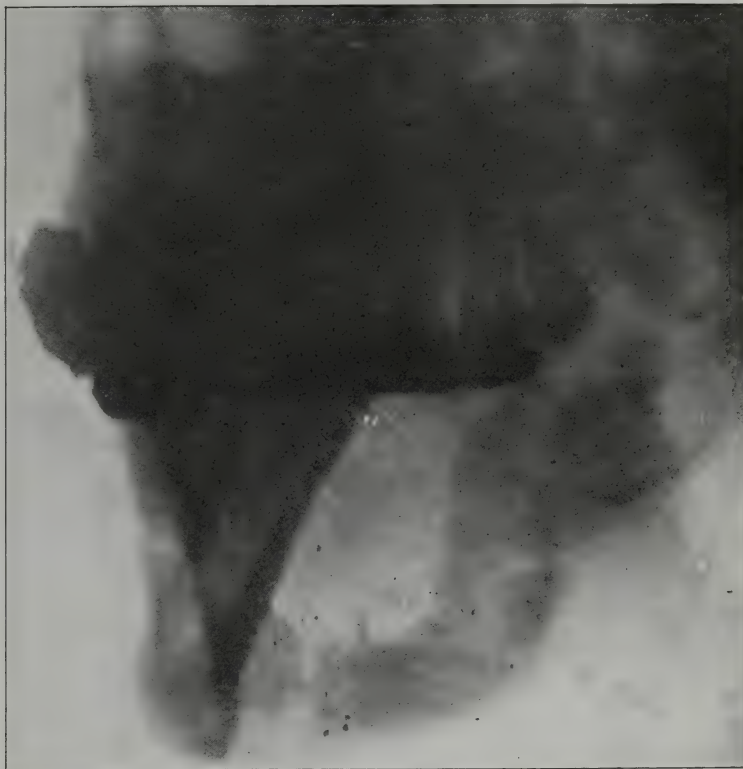
Shows comminution and large destruction of bone. Note how saddle rests on posterior fragment. Photograph October 11, 1918.

mandible was fractured at six different points. The X-ray showed a large destruction of bone and fragments un-united on October 10th. Patient was seen daily and the mouth cleansed with potassium permanganate and the gums painted with argyrol 25 per cent.

markable recovery. Will be furloughed for thirty days, after which a permanent prosthesis will be constructed to restore the bony substance and the teeth.

Captain Irving, Base Hosp. No. 8, put the first splints on in this case, but the patient became ill on the way over

FIG. 46.



Bone completely united; patient able to masticate semi-solids. February 20, 1919.

During the month of November a number of pieces of necrotic bone were removed, and on December 10th the sinuses were healed. Dakin's solution was also used with good results. On January 15, 1919, saddle attachment was removed; the inclined plane was still used.

February 15th: X-ray shows on this date all fragments united and bone filling in rapidly. Patient has had a re-

and the splints had been removed. We constructed splints along the same lines with excellent results.

(See Figs. 41 to 46.)

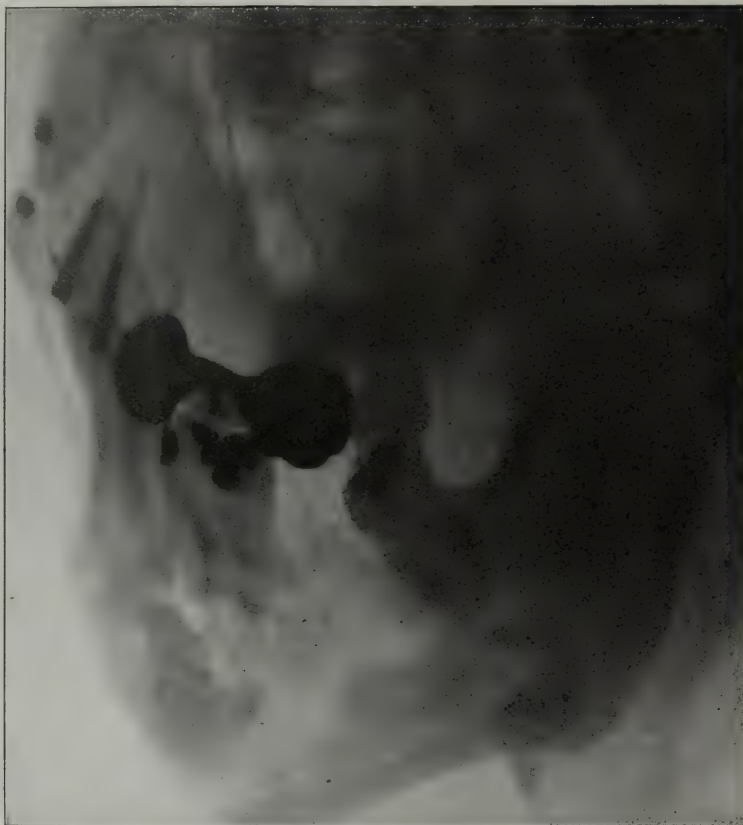
CASE VIII. Wounded July 15, 1918, by pieces of shrapnel entering the right side of the neck in three places just below the mandible. Some of the pieces lodged in the neck, others passed up and

out through chin and left cheek. All of the mandible on the right side between the lower right cuspid and the angle was destroyed; left mandible badly fractured. Patient treated in several different hospitals in France, finally being sent back and arriving at this hospital October 2, 1918.

ing the wires the jaws were pulled into proper position and wired together in about nine weeks. These were then removed and cast aluminum splints with inclined planes inserted.

The posterior fragment in this case moved forward nearly 3 cm. The left fragments are firmly united. The teeth

FIG. 47.



Left view of mandible before splints were applied. October 15, 1918.

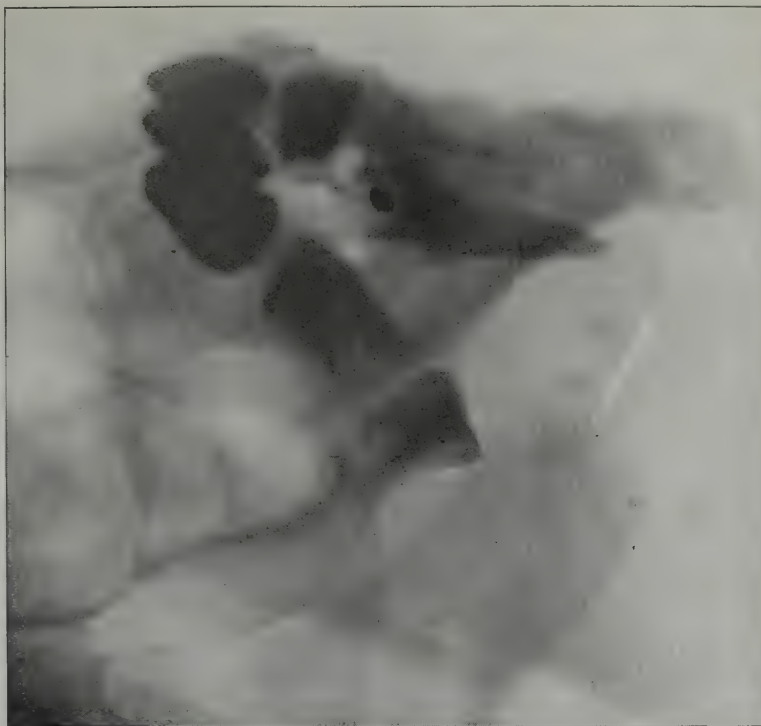
While in France the teeth had been wired together, but the wire was loose when he came into our hands. The chin or larger fragment was displaced backward and to the right 2 cm.

Cast aluminum splints for the upper and lower jaws were put in place, lugs were cast on the splints to which wires were attached, and by gradually tighten-

are in normal occlusion and the patient can masticate soft solids. The right side has a fibrous union, and bone will have to be grafted. The splints that are now on this case have also the pin-and-tube attachment, so that the jaws can be immobilized following operation.

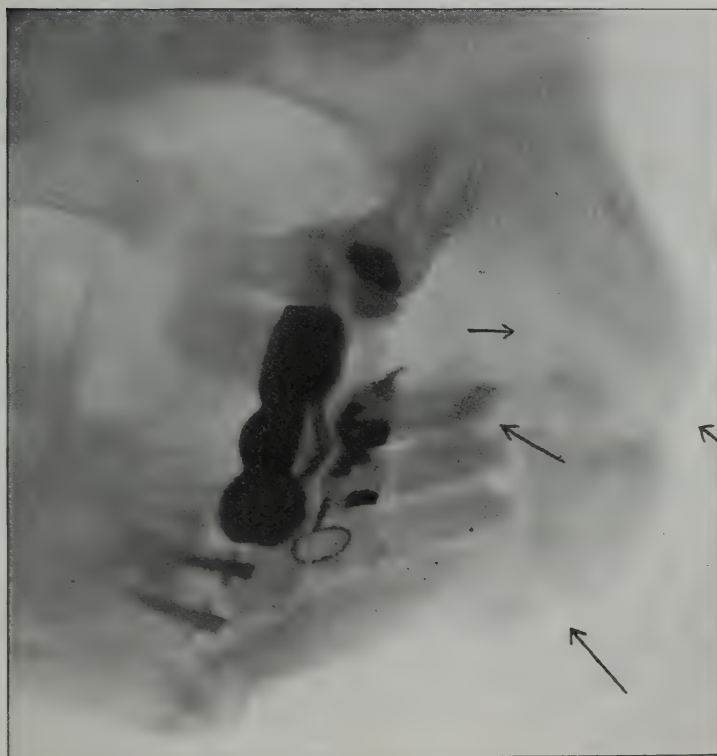
(See Figs. 47 to 50.)

FIG. 49.



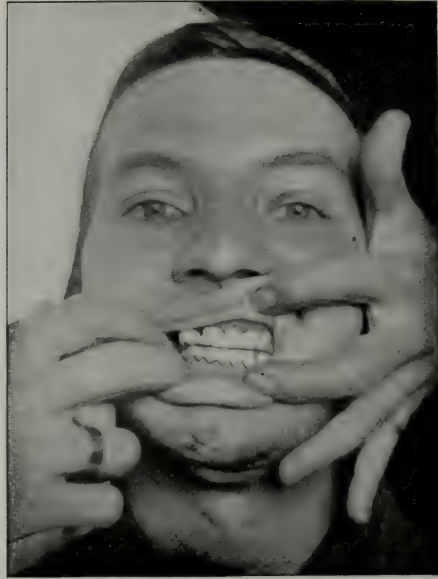
Right view of mandible. The destruction here necessitated a bone-graft. Splint to be made with attachment to rest on the posterior fragment to hold it in normal relation during operation.

FIG. 48.



Left view of mandible after splints had been in place eight weeks. Note bicuspid in fracture which had to be removed, due to infection; also, new bone formation. December 15, 1918.

Fig. 50.



Splints in place and fragments aligned; teeth in occlusion. (Case VIII.)

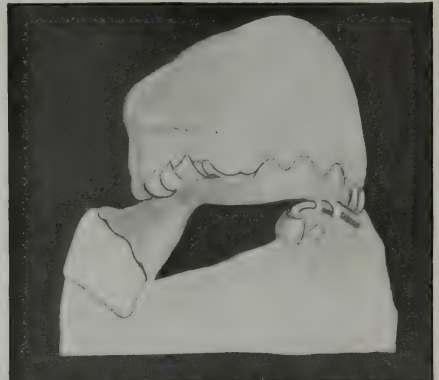
CASE IX. Shrapnel wound, July 15, 1918, compound comminuted fracture of destroyed. October 19th, remaining teeth wired together.

Fig. 51.



(Case IX.) Models adjusted for splints.

Fig. 52.



Splints on models. Note saddle on upper splint. The natural pull of the muscles keeps the posterior fragment in this saddle.

left mandible extending from left second molar to angle of the jaw. There was loss of bone and all teeth in this area were

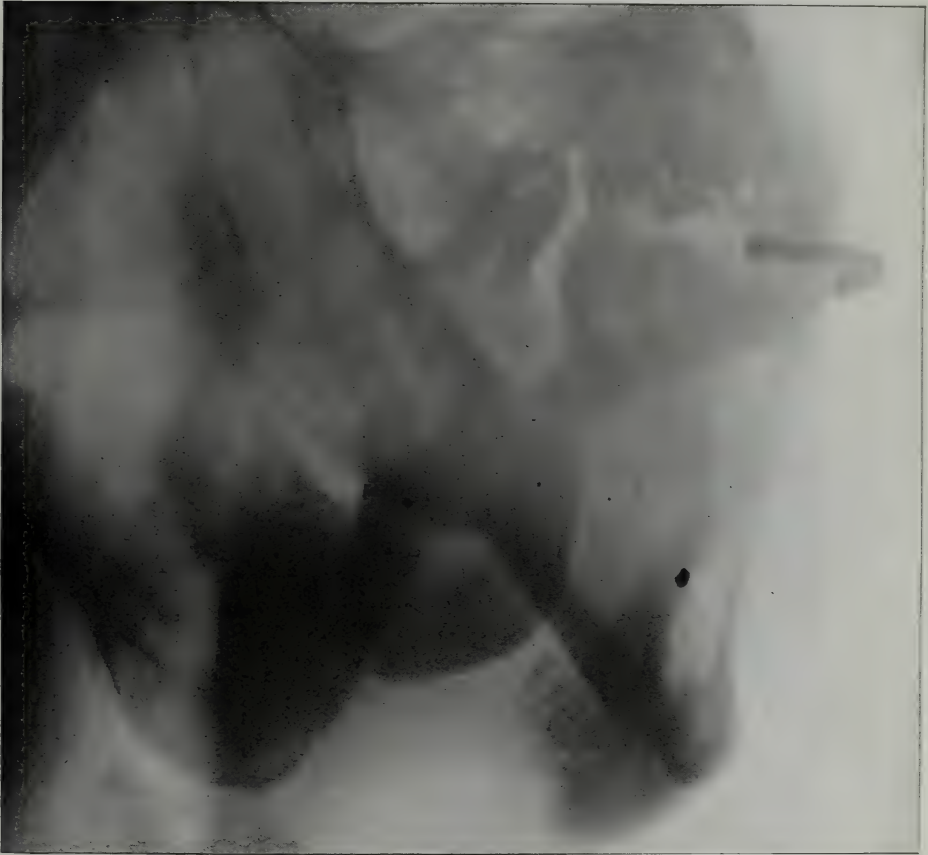
Arrived at U. S. A. Gen. Hosp. No. 11, November 25th. Posterior fragment was displaced inward and upward. Im-

pressions were taken, and cast aluminum splints made for both upper and lower jaws; the upper splint contained a saddle into which the posterior fragment was placed, to permit the insertion of a

Nose Splint.

This splint is primarily a nasal splint to serve as a rigid support after plastic restoration of the nose. It has met with

FIG. 53.



Splints in place. Note how posterior fragment rests in saddle. January 1, 1919.

bone-graft. Bone-graft inserted January 15th. Patient slowly recovering.

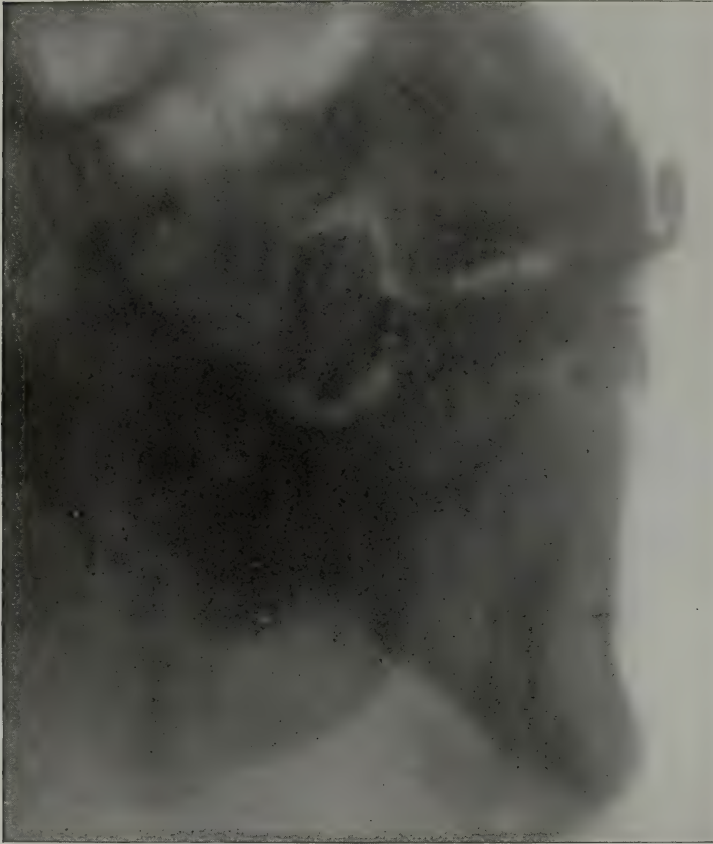
(See Figs. 51 to 54. See also Figs. 55 and 56, introduced from other cases, to illustrate the indication or contra-indication for the wiring of fragments.)

the approval of Col. V. P. Blair, who has used it successfully in one case. This type of splint is especially useful in those cases in which the nose must be restored in whole or in part by skin flaps from the cheeks or forehead and in which the supporting tissues are absent. Such a

restoration was done in Col. Blair's case and the vestibules of both nostrils were lined with epithelium by covering each splint with Thiersch grafts before inserting into the nostrils. The technical de-

Technique. Modeling compound impression is taken of the upper teeth, the tray left in the mouth, and plaster built up over the nose and lip to get the relation of the nose to the teeth, as

FIG. 54.

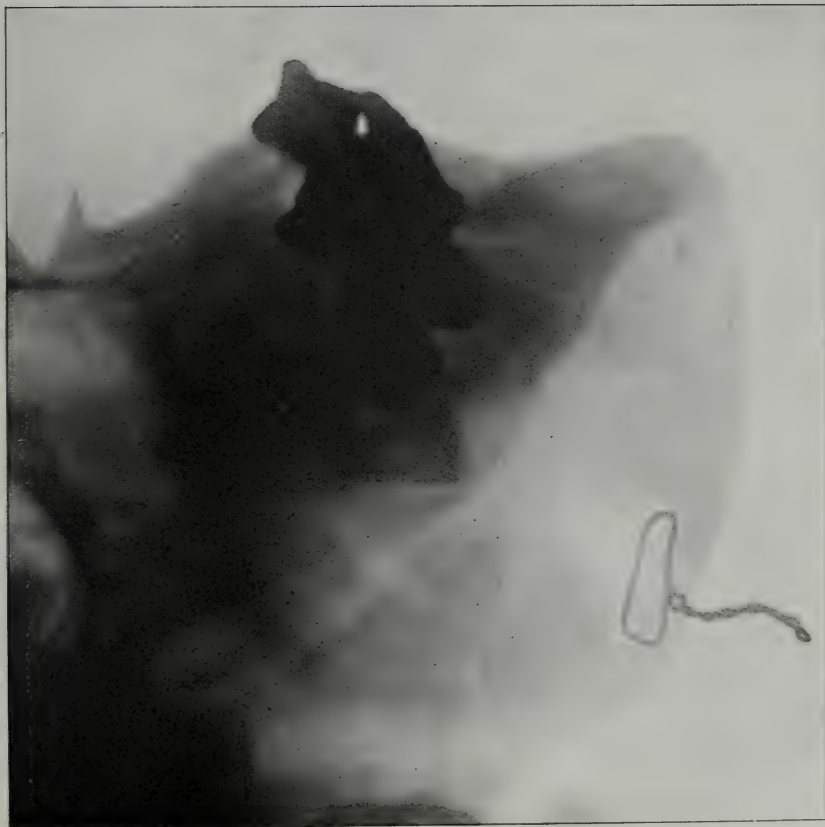


Bone-graft (rib in place). February 2, 1919.

scription shows how the original splint was constructed. After this splint had been made we made up the nasal portion of the splint of assorted sizes—so that in later cases the dental portion of the splint alone should require a special model.

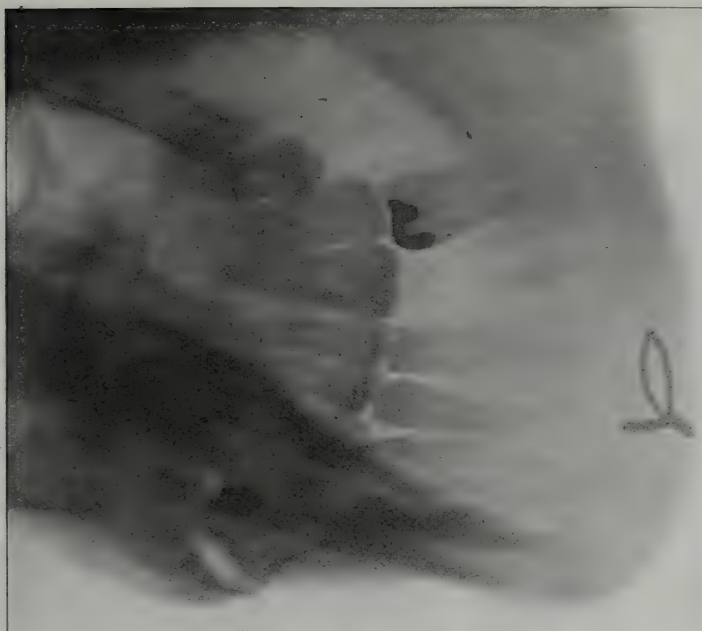
illustrated in Figs. 57 and 58. The tray and face mask were removed together, getting impression as in Fig. 59. The nostrils are enlarged in the plaster nose to permit entrance of wax models of a normal nose, then a splint is made for the upper teeth, with an extension to go

FIG. 55.



This case is introduced to show where wiring of fragments is indicated. In this case no teeth remained in the posterior fragments and there was about 2 cm. loss of substance at angle. Bone operation performed and silver wire passed through fragments for two months with the pin-and-tube type of splint. Patient was discharged completely cured, good bone union. The wiring of the jaw was done by Col. V. P. Blair.

FIG. 56.



This case shows where wiring of the fragments was contra-indicated. A simple fracture, no teeth lost. This caused malocclusion of the teeth in the anterior fragments and was extremely difficult to remedy. This could have been avoided by a simple splint. This was not done in an American hospital.

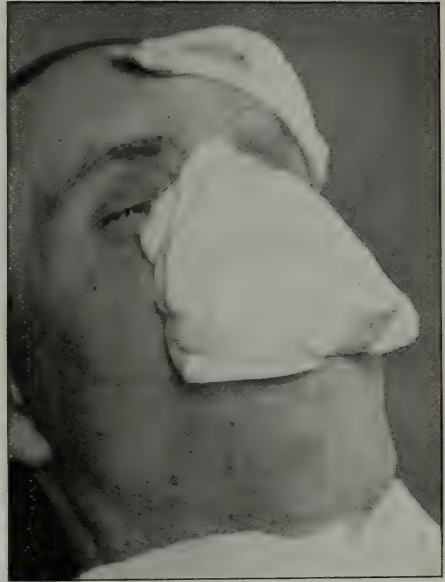
Jaws protruding through the cheek. The wiring of the

up over the lip. This connects with wax models of the nose. The nose is made in each extension to permit a small screw and nut to pass through.

FIG. 57.



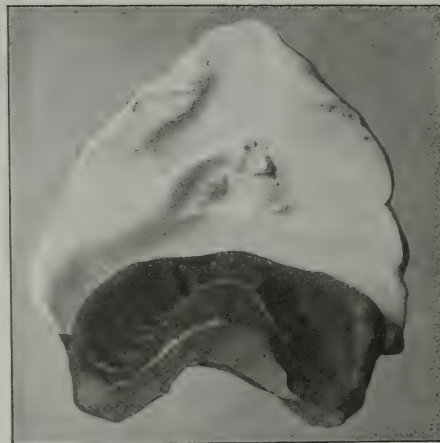
FIG. 58.



First step is here shown. Modeling compound impression with tray left in place.

Plaster-of-Paris impression of lips, nose, and tray.

FIG. 59.



Impression of teeth and nose removed together.

splints are hollow and lap over the extension from the mouth splint. A hole

The splints, which have been made up in ordinary base-plate wax, are invested,

the wax burned out, and cast in aluminum. Figs. 61 and 62 show the finished

Note. From the opening of this service here, Aug. 25, 1918, to Feb. 1, 1919,

FIG. 60.

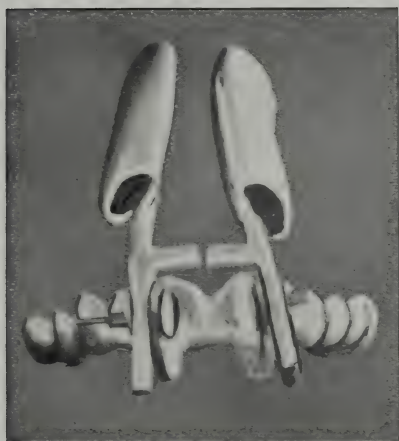


Large model to give relation of nostrils to the teeth; smaller model on right is lead made from impression of nose. That on the left is a hollow wax model ready to be attached to the extension that screws to the dental splint.

case. Fig. 63 shows the appliance cemented on the teeth previous to oper-

194 cases of fractured jaws were treated. In all of them a good functional result was obtained except in one case which is still doubtful. (Fig. 65.)

FIG. 61.



Front view of splints ready to be cemented on the teeth.

FIG. 62.



Side-view of same.

CONCLUSIONS.

ation. The nose splint is removed and sterilized before operation, the screws permitting its ready adjustment.

Our work thus far has led us to the following conclusions regarding the treatment of ununited fractures asso-

FIG. 63.



Splints in place. This illustrates two separate appliances; the one on the teeth is for support only to the nose appliance, which is adjustable for the convenience of the surgeon when working on the nose.

FIG. 64.



Reconstructed nose following operation; taken four days afterward. Operation performed by Col. V. P. Blair.

ciated with a large loss of bony substance:

(1) Wiring teeth is contra-indicated except as a temporary measure.

FIG. 65.



This patient has no teeth on lower jaw; all destroyed with the right body of the mandible and with a fracture at the left mental foramen. The chin had dropped back. A splint was made for upper teeth having a two-inch extension between the lips, with an opening at outer end for wires to be attached. Col. Blair sawed through the left ramus to give length, then exposed the fracture at the mental foramen, freshened ends and drilled holes in bone; silver wire passed through and wired together, ends of wire protruding through skin of neck. Two silver wires were then passed into mouth around chin fragment, jaw pulled forward with these wires and attached to extension on upper splint. The pressure was so great on upper teeth that a pulley was attached to chandelier in ceiling and a strong cord attached to wires in chin, and passed through the pulley, a pound weight being attached, to relieve the pressure.

(2) An interdental splint should always be used in fractures of the mandible where there is a large loss of bony

substance, and especially where the molars only can be used as points of fixation, and where the injury occurs posteriorly to the last tooth.

(3) The pin-and-tube type of interdental splint herein described has advantages far superior to any heretofore used.

(4) The jaws should be placed in the rest position when the fracture is anterior to the angle.

(5) Where there is destruction of at least half of the ramus, fibrous union only can be secured.

(6) In the great majority of mandibular fractures associated with loss of substance the posterior fragment should be drawn forward.

(7) When a compound comminuted fracture is present at the median line, springiness will often occur even after primary union has taken place and an apparently perfect result has been ob-

tained. This springiness permits the two bodies of the mandible to swing inward, causing malocclusion. We therefore contend that these cases should be given permanent support by fixed bridge work.

(8) Notwithstanding previously published opinions to the contrary, the case illustrated in case IV shows that old comminuted depressed fractures of the upper maxilla may be reduced and the teeth brought to normal occlusion.

(9) That immobilization of the jaws will not alone produce trismus.

(10) Good food, fresh air, congenial surroundings, employment of both mind and body—all are aids, and should be enlisted wherever possible.

I wish to especially thank Lieut. L. G. Grace of Philadelphia for assisting in collecting data; also Lieut. E. P. Dameron of St. Louis, Mo., and Lieut. G. H. Flanders of Whittier, Calif.

Oral Prophylaxis in Its Relation to Preventive Dentistry.

By ARTHUR H. MERRITT, D.D.S., New York, N. Y.

NOWHERE is the proverbial ounce of prevention of more value than in the domain of dental practice. This is true because to a large extent the most common diseases occurring in the mouth (and possibly in the human body) dental caries and pyorrhea alveolaris, are to a large extent preventable diseases, and also because of their more or less irreparable nature. Under no circumstances does dental caries heal as might a similar lesion in tissues of a different nature; the destruction caused by its progress, in so far as regeneration of tooth structure is concerned, is a permanent one. To a less degree this is also true of pyorrhea. Under certain conditions which it is always difficult and sometimes impossible to control, bone re-

generation may take place about teeth involved in pyorrhea, but the results can never be wholly satisfactory and are always uncertain; treatment, no matter how skilfully applied, can never equal in value the ounce of prevention. One would naturally conclude, therefore, that the dental profession, and investigators within its ranks everywhere, would make it their chief concern to study the way and devise the means by which diseases so nearly universal as to affect all races and all ages could be prevented; that they would realize the futility of ever hoping to make progress through therapeutic or restorative measures long since proved inefficient and inadequate. This, however, has not been the case. From its earliest beginnings the face of den-

tistry has been set in the other direction; it has exalted Cure and neglected Prevention. It has placed the mechanic's art upon a pedestal, and called the scientific investigator an impractical visionary. When more than fourscore years ago American dentistry had its birth, it was natural and right that it should address itself to the relief of the conditions then prevailing. All about it were edentulous jaws and aching teeth. Relief became its first duty. But though there still exists a vast amount of suffering from these same conditions and this despite more than three-quarters of a century of reparative dentistry, there is no longer any excuse for making restorative procedure the beginning and end of dental practice. It can no longer be said, as was said in those early days, that one is a good dentist because he is a good gold operator, or because his prosthetic restorations measure up to the most approved principles of the mechanic's art, though unfortunately these things still remain the criterion by which he is judged. These things are important, but they are not the most important; they play a large part in dental practice, but they can never play the whole part, nor can they ever meet the needs of those dependent upon our services.

As might be expected under these conditions, knowledge regarding the prevention of dental caries or pyorrhea alveolaris is limited. Almost nothing is known regarding the influence of heredity, diet, internal secretion, chemical reactions, etc., upon either of these diseases. It is true there have been investigations along these lines, but so far they have been of little clinical value. There is no specific. If, however, one considers the causes of these diseases, even in the light of our present imperfect knowledge, he cannot fail to be impressed with the very large part played by uncleanness of the mouth in their etiology and progress. That dental caries involves more than uncleanness of the mouth no one will deny, for notwithstanding every precaution which can reasonably be taken in this direction, caries will develop in certain cases. It cannot be denied, how-

ever, that failure to keep the mouth clean plays a large part in the etiology of dental caries. To an even larger extent this is also true of pyorrhea. Therefore the exceeding desirability of cleanliness and of intelligent care of the mouth must be obvious. It is probably not too much to say, when one considers the far-reaching consequences of these diseases, that there is no one thing which could be done which would so elevate the national standard of health as would mouth hygiene. Not only would it very appreciably reduce the incidence of these diseases, but in large measure prevent their more serious complications. Nevertheless it is the most neglected feature of dental practice. The dental profession is neglecting to avail itself of the most potent means for prevention of which it has knowledge.

On the first page of his book on the "Principles and Practice of Filling Teeth," Prof. C. N. Johnson says:

The first duty of the dentist when a patient applies to him for attention to the natural teeth is the thorough removal of all deposits, provided the patient is not suffering pain;—before any filling operations are undertaken, the mouth should be put in as nearly a hygienic condition as may be secured by the utmost cleanliness. It is too often the case that operators seem to ignore this important procedure, and hasten to the insertion of fillings in teeth covered with calculus. It matters not how beautiful or how perfect an operation may be under these conditions, the work should never be considered as ideal dental service. No successful architect ever builds a house without first looking well to the foundation, and no surgeon of repute will proceed to operate upon a wound without at least making the surrounding parts as healthy as may be in advance. Dentists are not living up to the highest possibilities of their art when they fail to consider the importance of maintaining the tissues around the teeth in a state of health, and this cannot be done short of a careful removal of all extraneous material which may be found adherent to the teeth. It would seem that sufficient emphasis had been given this matter by writers in the past, but the fact remains that with all that has been said, the profession is most lamentably lax when it comes to the observance of true hygiene of the mouth. The persistent

ignoring of this important phase of practice on the part of many otherwise excellent operators constitutes a grave reflection on their professional integrity and correspondingly lowers the standard of dentistry.

Admitting, therefore, the importance of oral prophylaxis and its important relation to preventive dentistry, let us inquire what are its limitations and what its possibilities. Its chief limitation lies in the fact that to a large extent one is dependent for success upon the co-operation of the patient, and this co-operation he may not always receive. This is especially true of children, and since dental caries is largely a disease of childhood, one is often seriously handicapped in his efforts toward its prevention. Careful instruction, however, will go far toward overcoming the natural indifference of children, as it will of adult patients. One is also limited by the fact that dental caries is a problem involving more than the question of cleanliness or uncleanliness of the mouth. The possibilities of oral hygiene are almost limitless, depending upon the efficiency with which it is carried out.

Oral prophylaxis may be divided into two parts, that performed by the dentist, which for convenience sake may be called "professional care," and that by the patient, "personal care." The leading part will be that played by the dentist, but it is by no means the whole part, nor the most important part. Success depends upon intelligent co-operation.

PROFESSIONAL CARE.

The first thing included in professional care is a careful and painstaking examination of the *entire* mouth. Note should be made of its hygiene, the patient's habits and method of tooth-brushing, type of toothbrush used, dentifrice, etc. The teeth should be examined for caries, defective fillings and restorations, faulty contact points, missing teeth, non-vital teeth, abrasions, erosion, cuspal hypoplasia, types of occlusion, etc. The investing tissues of the teeth should be examined for recession of the gums (pathologic and traumatic), gingivitis,

pyorrhea, alveolar absorption (precocious senile atrophy), fistulous abscesses, etc. The tongue, oral mucosa, and tonsils should also be examined.

With the examination completed, the next step (unless the patient is suffering) is thorough mouth-cleansing. This should begin with the removal of all calcareous deposits, food debris, etc., from the teeth. Every subgingival space should be carefully explored and the contents removed with properly shaped curets.

It is surprising how large a deposit of food debris, mucus, half-formed serumal calculus, etc., especially in adults, will be found in these spaces, and with little or no visible evidence of its presence. It is essential that this be removed in any effort at mouth-cleansing, though as a rule this is not done, the operation being limited to a removal of the gross deposits of salivary calculus and a perfunctory polishing of the teeth. Proper cleansing of these spaces cannot be done with the ordinary scalers designed for the removal of salivary tartar, which explains why it is so infrequently and so imperfectly done. Relatively few dental offices are equipped with proper instruments for performing this delicate and important operation. Small curets will be found most satisfactory. These may be had in rights and lefts of various designs to meet the different conditions in the mouth. I have found a selected list from the Younger-Good-Hutchinson set most useful. All scaling of tartar can be done with these instruments. Every subgingival space should be explored and its contents removed. This must be done in an orderly and not a hit-or-miss fashion. This should be followed by a thorough cleansing and polishing of the exposed surfaces of all the teeth. The polishing agent may be flour of pumice or silex. Personally I prefer to bathe the teeth with a disclosing agent, and remove the grosser stains with brush-wheels or rubber cups. Having gone over them in this way, the teeth are again stained and each one gone over individually with porte-polishers. Waxed silk tape charged with the polishing agent is passed back

and forth between all teeth, and fine strips used where indicated.

Ragged edges of teeth, so common in the incisor region, should be polished smooth. If hypersensitive areas are found at the gingival border they should be treated with formalin. Dip a thin orange-wood point in the solution, absorb excess, and vigorously rub over the sensitive area, repeating the dipping and rubbing process for a few minutes until all sensitiveness has disappeared. When carefully done, this is most effective.

Care should be observed not to get an excess of formalin against the gums, as it will cause sloughing. Silver nitrate is very effective where staining has not to be considered. This may be applied by having a small quantity prepared in a finely powdered form and dipping into it the moistened end of an explorer, to which a small quantity will adhere, when it can be carried directly to the required place without the inconvenience which so often attends its use in liquid form. It may be applied in this way between molar teeth where the early disintegration of enamel is suspected, allowing the moisture between the teeth to carry it into the approximal space. In this way, by its judicious use, caries on these surfaces may in many instances be permanently prevented. Roughened enamel and enamel which shows the etched effect of incipient caries, where accessible and not too deep, should be polished with Arkansas stones, with a view to smoothing these surfaces and preventing the development of caries. Final polishing of the teeth may be done with tin oxid or carmi-lustro. The case is now ready to be turned over to the personal care of the patient.

PERSONAL CARE.

This is of equal importance with the care given by the dentist, for without the intelligent co-operation of the patient complete success is impossible. It is important, therefore, that he be made to realize his responsibility and be carefully instructed in what is expected of him. No detail should be omitted. Inquiry

should be made regarding habits and methods of tooth-brushing, types of brushes and of dentifrices used, etc. Proper brushes and dentifrices should be prescribed and their use demonstrated. The brush should be small and of good quality; the dentifrice of known composition. Instruction in correct methods of tooth-brushing should be given. Unfortunately there is no standardized method, and until there is one based on correct principles, confusion is bound to prevail. The public has been taught the importance of oral hygiene, but has not been taught how to achieve it, which partly explains why it has failed as a preventive measure.

Oral prophylaxis has for its purpose the effective cleansing of the mouth, the prevention of disease within its borders, and the providing of a certain amount of artificial exercise and stimulation to the teeth and their investment. To accomplish this, some method must be adopted which is simple, effective, stimulating, and at the same time free from injurious effects. Careful study of the problem shows that there are but two directions in which a toothbrush can be used in the mouth—horizontal and vertical, the so-called rotary motion being but a combination of these two. Every dentist is familiar with the injurious effect of horizontal tooth-brushing. Practically all of the abrasion of the teeth and traumatic recession of the gums may be ascribed to this cause, coupled with bad dentifrices. It has the added disadvantage of being inefficient; it does not clean the mouth and teeth. To a less extent the same thing is true of rotary brushing. Furthermore, it is unnecessarily complicated, which of itself would disqualify it. The only remaining way in which teeth can be brushed is vertically—up and down. This can be done by brushing the upper and lower teeth separately, always brushing occlusally, as is advocated by some on the assumption that brushing from the teeth toward the gums will injure the latter and cause them to recede. The objection to this method is that it provides less friction, exercise, and stimulation to the teeth and gums

than would straight up-and-down brushing applied to the buccal and labial surfaces of the teeth of both jaws without regard to whether the gums were brushed up in the maxilla or down in the mandible. To brush the upper and lower teeth separately also increases the time consumed and is less simple as a method than is joint brushing of both jaws.

The only objection that has been urged against this method is that it will cause gum recession. No one denies that vertical brushing is the logical way in which to clean the teeth, as their surfaces can in this way be brushed throughout their entire length and the bristles of the brush be carried into each embrasure as far as the contact points will permit. It also provides, as no other method does, vigorous exercise and stimulation of the teeth and gums. At the same time it is so simple that even a child can learn to practice it efficiently.

The one question, therefore, which remains to be answered is, Does it cause gum recession? After brushing my own teeth in this way for more than twenty years, and observing its effects in the mouths of my patients for almost that length of time, I have yet to observe a single case in which this has occurred. It is of course necessary that small brushes of correct shape and quality be used, together with dentifrices free from injurious abrasive agents. Nature has made provision against stress of this kind. The gingival group of fibers from the pericementum pass into the gingiva in a vertical direction, with the result that this tissue will withstand a very considerable force when vertically applied.

Everyone is familiar with the relative ease with which any structure can be injured when friction is brought to bear against, rather than with, the fiber; the same thing holds true of living tissue. Moreover, the thick pavement epithelium which covers the gingivæ further protects them against vertical stress. It will be seen, therefore, that nature has made provision against vertical stress, which is the only force normal to the mouth. All the friction produced by the

mastication of food is in line with the long axis of the teeth. It is a force always directed *against* the gingiva, never at right angles to it. This explains why it is that brushing *against* the gingiva does not injure either teeth or soft tissue, providing only that it be intelligently done.

VERTICAL BRUSHING OF THE TEETH.

Place the brush on the buccal surface of the molars on one side, and sweep the brush up and down vigorously as far as the lips and cheeks will permit, passing in this way from one molar region to the other, brushing the teeth and gums of both jaws simultaneously. The bucco-distal surface of third molars can best be reached by a semicircular motion backward and occlusally, with the mouth partly closed to relax the muscles in this region. The mouth should next be opened and the brush placed on the gums at the lingual surface of the last lower molar, and the gums and teeth thoroughly brushed. In the molar and bicuspid region the stroke will be more or less horizontal, becoming vertical as it approaches the median line, again returning to the horizontal as the molars on the opposite side are in their turn brushed, at the same time brushing the occlusal surfaces. Horizontal brushing in this region can do no harm, as the sweep of the brush is limited. This procedure should in turn be repeated on the lingual surfaces of the upper teeth. The tongue should then be extended, and carefully brushed. This can be more efficiently done with a tongue scraper, but what is gained in efficiency is lost by complicating the operation. The ideal time for tooth-brushing is before breakfast and after each meal. In an editorial in the *Journal of the American Medical Association*, September 21, 1918, the statement is made that the total number of bacteria in the mouth are greatly increased during the night and after meals, that the organisms found on an unbrushed tooth are three times as great in number as are those on teeth that have been brushed—an excellent

argument in favor of brushing before breakfast and after meals. As far as possible the waxed silk tape should be used after each meal, not only for the removal of food débris, but, more important even than this, for the removal of the mucin plaques upon the approximal surfaces. It should not be forgotten that this surface, next to the occlusal surfaces of molars and bicuspid, is the most prone to caries, and is so because it is not kept free of these plaques. These surfaces cannot be kept clean by the brush. Dependence must therefore be placed upon the silk tape. Its importance in the toilet of the mouth is equal to that of the brush—a fact, usually overlooked, which explains one of the causes of failure in oral prophylaxis.

Proper care of the mouth and teeth will require more time than is usually given to it, but it is always time well spent.

There still remain a few questions which should be considered, such as the value of mouthwashes, the frequency with which prophylactic treatment should be given, and what may reasonably be expected in the way of actually preventing dental caries and pyorrhea where it is conscientiously followed.

MOUTHWASHES.

Antiseptic mouthwashes play but an insignificant part in preventive dentistry. Their habitual use is unnecessary, and should be discouraged, as they have no place in the healthy, well-cared-for mouth. In the form in which they are used their germicidal power is almost *nil*. The clinical value of acid washes has not been established, though the principle upon which the theory is founded would seem to be correct. If so, the use of antacids in the mouth, such as magnesia, sodium bicarbonate, lime water, etc., must be unscientific and actually prejudicial. Alkaline dentifrices would also have to be discarded. They have their value, but it is abrasive and not therapeutic, which property can be retained and the alkalinity eliminated.

FREQUENCY OF PROPHYLACTIC TREATMENTS.

No hard-and-fast rule can be made in this matter. Each case must be considered by itself—the natural cleanliness or uncleanness of the mouth, the patient's success in personal care, etc. The rule should always be to encourage personal care—to so interest and instruct patients in their care of the mouth that relatively little care of a professional nature will be required. It is impracticable in most cases, and ought to be unnecessary, to impose monthly treatments upon patients. It will certainly be unnecessary for the patient who follows instructions, and will avail very little in cases where this is not done. Unfortunately dental caries is largely a disease of childhood—and that is an age when intelligent co-operation is not easily obtained. Success, however, will depend upon such co-operation rather than upon professional care, even though the patient is seen at frequent intervals.

The mouth should first be put in good condition and the patient made to understand that it is his duty to maintain it in that condition. With adults two to four annual visits ought to be the maximum number required for any except the most unusual cases.

ORAL PROPHYLAXIS AS A PREVENTIVE MEASURE.

What reliance can be placed upon oral prophylaxis as a preventive of dental caries? Inasmuch as dental caries involves other problems than that of oral cleanliness, it cannot be expected to be a panacea, and no such claim is made for it.

Until more is known regarding the laws of immunity and susceptibility, one cannot hope to be wholly successful in the prevention of dental caries by any available method. Nevertheless much can be done, and the most potent instrument at our command is mouth cleanliness. Dental caries may be defined as an acid fermentation taking place upon the

surface of enamel due to the action of micro-organisms. It is obvious that this phenomenon cannot take place upon a clean and polished surface; that it is necessary for the organisms of caries to attach themselves to the surface of a tooth and remain there undisturbed for a period of time, in order to produce decay. This is clinically confirmed by the fact that the labial and lingual surfaces of teeth are less susceptible to caries than are the approximal surfaces, and they are so not because these surfaces are intrinsically more resistant, but because they are cleaner, which is only another way of saying that the organisms of caries are not allowed to remain on these surfaces long enough to affect their solvent action. If the susceptible areas were kept as clean as these more exposed surfaces, they would be equally free from caries—a service incomparably greater than any which may be achieved through restorative dentistry.

As a preventive of pyorrhea, oral prophylaxis is even more effective than in caries, in that it keeps the mouth clean and, through the stimulating ef-

fect of vigorous brushing, induces healthy circulation in the supporting tissues of the teeth. Probably most of the cases of pyorrhea which find their way into the hands of the periodontist would never have developed had oral prophylaxis been intelligently observed. No disease in the mouth is more easily prevented, none more difficult to cure.

In conclusion, it may be said that oral prophylaxis, when given its broadest interpretation, can be made a most efficient instrument in the prevention of dental diseases; that it far outranks in value any service which restorative dentistry can confer; that it should be the first duty of every dentist to make the mouths of his patients clean, and teach them how to keep them so; that in so doing the dental profession can not only largely prevent the incidence of these diseases within the mouth, but what is of even greater importance, prevent that vast train of diseases which have for their causes the infections associated with non-vital teeth and pyorrhea alveolaris.

59 WEST 46TH ST.

Plastic Surgery and Auricular Prosthesis.*

By Dr. PONT (Méd. aide-major de 1^{re} classe), Paris, France,

CHIEF OF THE CENTER FOR STOMATOLOGY, FOURTEENTH DISTRICT.

THIS paper will deal only with loss of substance of the pinna, the other lesions of the internal and middle ear belonging exclusively to the domain of oto-rhino-laryngology. We assume further that the lesions are cicatrized. As a matter of fact, in these instances, and contrary to what happens in maxillo-dental lesions, the prosthetist starts when the surgeon has finished his work.

We are therefore going to consider first, what the surgeon has to do in cases when the pinna is hurt by wounds or affected by disease, and next what the prosthetist has to do when the surgeon yields his place to him.

In the first place, two distinctions reveal themselves from the etiological viewpoint. If the loss of substance is due to a tumor or cutaneous tuberculosis, the surgeon would be acting for the best by abstaining, at any rate temporarily, from executing any plastic restoration; and in such cases the prosthetist must, either temporarily or definitively, make up for the loss of substance by means of an apparatus.

If it is a matter of burns or traumatism—and such cases were frequent in this war—the surgeon can properly intervene, except in case of total loss of the pinna, as we shall see hereafter; for, as a matter of fact, from the viewpoint even of surgical indications, the extent to which substance is lost is also a point of great importance.

In case of total loss of the pinna, it is better, until ampler knowledge and consideration of the case are available, to

forego any plastic operation. Moreover, we would here quote what Nélaton and Ombredanne say in their book "Treatise on Autoplastics": "The surgeons are all but unanimous in admitting that the total reconstitution of the pinna is above the resources of their art. In general, when the removal of a malignant tumor destroys the ear, one must be content, with Morestin (see Maillard, *thèse de Paris*, 1900, p. 35) to cut in the neighborhood a strip or patch which, twisted on its pedicle, fills the lack of tissue to the flat surface."

However, some tentative devices have been made to replace the missing ear either by grafting or by autoplasty.

When the wounded man arrives immediately after the traumatism, and the pinna is almost entirely separated, a regular and perfect cicatrization can be secured by an immediate and carefully operated suture. Success in these cases has been obtained even with pedicles of a few millimeters.^a

Quotation even is made of cases where the ear wholly separated from the head is said to have been replaced and sutured again with success. Among the most genuine and ancient instances, one might mention that of Magnin, 1819 (quoted by Ombredanne), of a soldier in whose case one stroke of a sabre cut off entirely that part of the ear extending over the external auditory meatus, separating it from the remaining lower part. The

^a See Béranger and Féraud, *Gaz. des Hôp.*, 1870, quoted by Ombredanne.

* This paper is taken from *La Restauration Maxillo-faciale*, Paris, November 1918.

fragment was put back in place and maintained by agglutinants. It re-united perfectly well. But still better than this has been done, and in a case of total loss the attempt has been made to graft on the patient an ear taken from another person. It is said that this operation was carried out with success in the United States.

We do not think that any attempt has been made to make total reconstruction of the pinna by autoplasty. Szymanowsky has propounded an outline for the patch, and Buisson is said to have attempted a similar operation on a dead body, but if the difficulties of the opera-

FIG. 1.



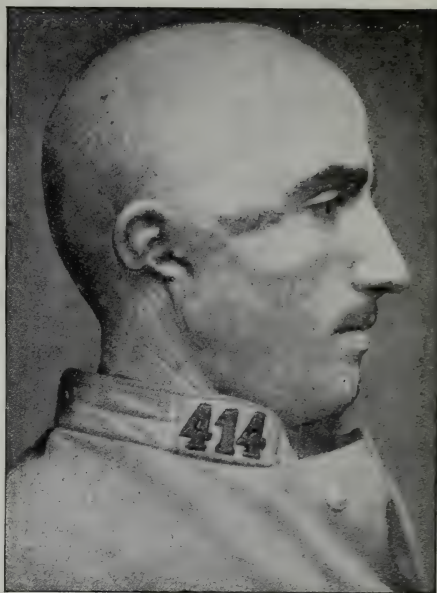
Operation for loss of lower half of the ear:
Incisions for the dissection of the adjacent parts.

tion and the mutilations to be met are considered, we are of opinion that it is advisable, in case of total loss of the ear, to resort to prosthesis rather than to any surgical attempt.

In case of partial loss of the pinna, and when the plastic operation is not contra-indicated owing to the general or local condition, the work belongs to the surgeon—as it is possible by surgery to obtain a satisfactory result, from the esthetic viewpoint, preferable to that from any prosthetic intervention.

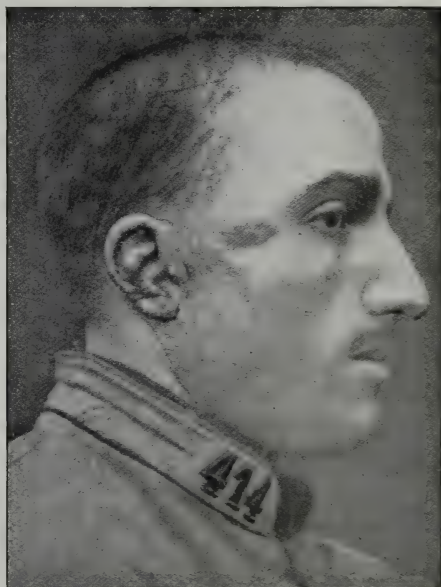
I will not describe all the operative processes, which may be found in any special treatise, but will limit myself to the case of one of the wounded entrusted to my care on whom I performed the partial autoplasty of the ear:

FIG. 2.



(Case I.) Loss of substance of the ear by shrapnel.

FIG. 3.



Same patient after the operation.

CASE I. Ernest F., age twenty-two, 414th Infantry; wounded August 3, 1916, at Firmin Wood, by shrapnel, in the face and in the right shoulder.

After the lesion of the shoulder was healed, he was removed to Lyons June 7, 1917, to complementary hospital No. 9 for the designing of an auricular prosthesis.

At the clinical examination, loss of substance of the lower half of the pinna of the ear affecting the cartilage and the lobule was found. The skin of the right cervical region being normal and supple, it was decided to attempt the autoplasty of the lobule by taking a cervical strip. The dimensions of this strip were first studied on a plaster mold on which a wax reconstruction of the missing part had been made.

October 29th: Intervention (by Dr. Pont) under general anesthesia:

(1) Incision A B in order to freshen the stump. Cutting of a quadrilateral-shaped patch B E F D, which is folded, its face scarified inside, then E and B and F and D sutured.

(2) There remains a loss of substance of the posterior side of the lobule; this is filled up with two lateral patches L' and L'', which are turned round following the direction of the arrows.

(3) The scarified part resulting from the folding of patch L is filled up by "gliding" L''.

The operation scars cicatrized normally and the threads were taken away eight days after.

November 18th: The patient leaves for forty-five days' convalescence, but to return for completion of treatment. On his return, a retouching to the lobule is to be made to free it from adhesions to the cervical region.

February 1, 1918: Retouching under local anesthesia:

Decollating of the lobule to turn it over backward. Cutting off a cutaneous patch of the cervical region, which by "gliding" supports the lobule in its new position.

At the present time, February 15th, the wound is cicatrized, all the missing part of the pinna is perfectly well reconstructed, as shown in photograph. (Fig. 3.) The patient can be considered as healed, from the esthetic viewpoint, and he would have returned to camp if it had not been for auditory troubles, the military consequences of which necessitate his entering the auxiliary service (as unfit for active duty).

This is after all the method of occipito-mastoid patch doubled on itself, described by Ombredanne, with the differ-

ence that, in the method followed by us, properly speaking there is no pedicle and the operation is done in one step only. As the pedicle in a manner is a continuance of sound tissues, we have easily in our case filled up the loss of substance by cutting a secondary patch which has replaced, by gliding, the loss of substance caused by previously taking off the autoplasmic patch.

I have not had to intervene in cases of loss of substance of the upper part of the pinna of the ear. Without enlarging on this aspect of the matter, I wish to state, however, that while the Italian and French methods seem to me advisable for repairing the lower part and the lobule, I am of the opinion that the Italian method is to be preferred in a case of loss of substance of the upper half of the pinna.

Let us see now what is the part of the prosthetist in cases either of total loss or of partial loss, when for any reason the surgeon has concluded that autoplasty would be useless.

Up to now the apparatus employed has consisted of rubber or metal, or of ceramics presenting peculiarities only in so far as concerns the means of retention. With this in mind, three conditions of injury met with may be considered:

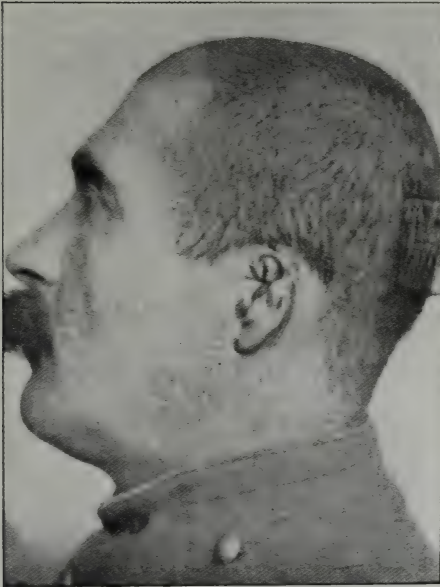
- (1) Total absence of the pinna.
- (2) Presence of a more or less deformed stump.
- (3) Absence of a more or less considerable part of the pinna, the remaining part being of normal form.

I will briefly recall the principal means of retention to which resort was had in each of these conditions:

(1) *Total absence of the pinna.* The apparatus is maintained by two attachments which complement each other.

In the first place, by gold wires surrounded by soft rubber acting as springs. The wires, two or three in number, start from the apparatus to which they are fixed and diverge one from the other. When fitting the apparatus they are maintained close together and are thus introduced into the external auditory

FIG. 4.



(Case II.) Loss of upper half of the ear, before placing the artificial portion.

FIG. 5.



Prosthetic reconstruction of upper half of the ear by plastic paste.

meatus. Once in place, they firmly maintain the apparatus by the pressure they exert upon the walls of the conduit.

The second means of retention consists of a steel stem like a spectacle bow, which starts from the back of the artificial ear, is hidden in the hair, and finds its supporting hold by bending on the top of the skull.

(2) *A more or less deformed stump remaining of the ear which is to be replaced.* The same first means of retention in the external auditory meatus as in the preceding case can be employed, and a second means of retention provided by a screw or clamp passing through a hole made artificially in the stump.

If the stump is flattened and offers sufficient resistance, as suggested by Martin, an artificial ear can be constructed consisting of two parts fitting one into the other as a box and its lid, and imprisoning the stump, which, in its turn, will hold the apparatus.

(3) *The pinna missing in part.* The missing part of the ear is reconstructed

and this artificial part is maintained either by means of hooks passing into one of the two perforations of the pinna, in case of need this apparatus being further consolidated and immobilized either by a spring in the external auditory meatus, or with a small steel or golden stem passing behind the pinna and bent slightly forward.

The inconveniences of this sort of prosthesis are, first, the weight and the fragility of the apparatus, and especially the necessity of combining such complicated means of retention, which further are not always reliable. I have therefore struck on the idea of employing the plastic paste (of which I have had opportunity of testing the interesting results in nasal prosthesis) in cases of partial or total loss of the pinna.

I will describe only two cases, one of a soldier to whom a partial ear was fitted, the other a total prosthesis:

CASE II. Louis B., age thirty-nine, wounded by accident at Suippes—a fall causing a wound in the left auricular region with partial tearing off of the pinna. Further, he

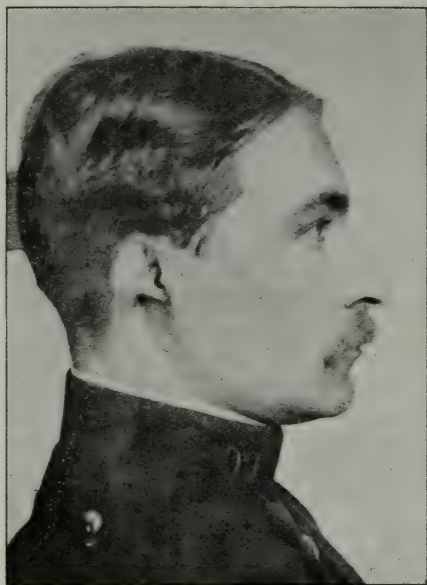
received a fracture of the mandible, which we shall not discuss here.

At the present moment all that is left of the patient's left ear is a deformed stump with various cicatrices. He prefers carrying a prosthesis to a surgical plastic. A mold is taken of the auricular region and a wax ear built on the mold. This ear is dealt with in the same manner as if it were a nasal prosthesis, that is, a two-part mold is taken by the usual methods; and in the mold thus

ternal auditory meatus alone could be utilized as a retention point. Thus an apparatus made of plastic paste seems to be especially suitable. Care is taken to place this ear on a base destined to cover the cicatricial tissue and to increase at the same time the contact surface with the skin. This surface, coated with special adhesive paste, makes it possible to obtain an absolutely perfect retention.

The esthetic result is none the less interesting, and is perhaps better than that ob-

FIG. 6.



(Case III.) Loss of entire ear, caused by shell fire.

FIG. 7.



Prosthetic reconstruction of the ear by plastic paste.

obtained the plastic paste is cast, after having been melted in a hot water-bath.

After about half an hour the ear is taken out of the mold and the excess plastic paste is removed by scraping; the ear is then put in place and fixed by means of the adhesive paste of which I have given the formula. As can be seen from the photograph (Fig. 5) the result obtained is very satisfactory. The mold being handed to the patient enables him to renew his ear as often he likes.

CASE III. R., sergeant 99th Infantry, wounded by shell splinter at the level of the right auricular region; complete loss of ear. No projecting part which could be used as a supporting point for a prosthetic piece; ex-

tained in the case of partial pieces, since the demarcation line between the apparatus and the skin, being outside of the ear proper, is more easily concealed and is not so noticeable.

At the present time, when prosthesis is the only resource left, I employ for losses of substance of the ear, as for losses of substance of the nose, two sorts of prosthesis. One, in painted vulcanite, is used for patients of the laboring class, and this I name the "labor prosthesis," and the other in plastic paste, which I name "esthetic prosthesis," and use in higher social life.

The vulcanite prosthesis, in spite of all

the skill of the painter, is not always very artistic, and from the standpoint of retention presents sometimes serious difficulties.

On the other hand, the artificial ears in plastic paste can be very easily fixed, and are ideal as for the esthetic aspect. I have had, however, in the case of old burns whose peri-auricular tissue had

ficial plastic ear—just as with an artificial plastic nose—can be remade by the patients themselves in a few minutes.

To sum up, for the lesions of the ear, as for all maxillo-facial lesions, the prosthetist and the surgeon must intervene sometimes simultaneously, and at other times in succession. Success depends upon their perfect understanding

FIG. 8.



Case of loss of substance of the ear.

FIG. 9.



Prosthetic reconstruction of the entire ear by plastic paste.

remained delicate, irritation of the skin due to the agglutinants employed to maintain the ear in place. That is the only inconvenience which I find with the plastic paste method in the case of auricular prosthesis.

In this situation, indeed, there is no secretion acting to detach the ear, as in the case of the nose, nor, in addition, does it get so dirty as in its application in the region of the nose. It results therefore that a careful patient need not replace his apparatus more than once a week, and it is well known that an arti-

and intimate co-operation. This seems to have been perfectly well understood by all our colleagues of the maxillo-facial services, and at the Inter-allied Dental Congress (November 1916) this was specially discussed in respect to maxillo-dental lesions. What we have desired to do was to complete the matter, by studying a few months ago the indications of the rhinoplasty and of the nasal prosthesis, and by studying today the part played by the surgeon and the prosthetist in cases of loss of substance of the pinna.

Case Report Showing the Value of the Radiograph as a Protective Factor in Dental Practice.

By D. B. WILLIAMS, D.D.S., Wilkes-Barre, Pa.

THE following case is reported with the intention of showing the value of the radiograph as a protective factor in dental practice—as it proved in this instance the peg upon which the reputation of a Pennsylvania practitioner hung suspended, until the whole pathological picture was revealed by the X-ray plate. Also the case itself is one out of the ordinary, interesting and instructive because of the conditions revealed during treatment.

The patient—Mrs. M., married, two children, and within two months of becoming the mother of a third child—was admitted to the Mercy Hospital of Wilkes-Barre on January 25, 1919. The dental surgeons were immediately called into consultation by the chief surgeon of the institution, and found the following conditions: Great swelling and induration of the entire right side of the face, intra-orally the mandibular processes protruding through the tissue from the site of the first bicuspid to a point just anterior to the angle with the ramus. Profuse discharge of pus into the mouth, also from a large fistula located below the angle of the mandible and about an inch above the clavicle of the same side. The tissues about the protruding processes were badly disorganized and sloughing was marked.

We at once sent the patient to the X-ray room and secured a remarkably clear plate, taken through the opposite (left) side, the ray being directed from below the mandibular border slightly upward and backward, giving a picture lacking the puzzling superimposed lines present when the ray is directed straight

through on a line with the mandibular borders of both sides.

The history given by the patient at this time placed the whole responsibility upon a dentist who had extracted the right second bicuspid a few weeks previously, in a well-directed effort to relieve an inflammation of long standing in that region. She stated that she heard a sharp “snap” when the tooth yielded to the forceps and was positive the dentist had “broken her jaw.” In her mind at least *his* future was a bit uncertain.

When the X-ray plate was developed the true story was before us in an instant, and at once absolved the dentist who did the extraction from all blame.

The X-ray (see Fig. 1) revealed a complete sequestration of the right side of the mandible from the first bicuspid to a horizontal line running just below the neck of the condyle forward under the coronoid process. In the bicuspid region, instead of the more or less angular character of a fracture following trauma, we found a marked destruction of the body of the bone extending practically to the lower border, the line of the anterior limit of the necrosis extending in a long curve under the first bicuspid and then backward to the inferior border, the posterior line curving backward as it extended downward and then forward to the inferior border.

Clearly this extensive necrosis could not have been the result of a recent injury. Equally clear was it that, perhaps over a period of *years*, this resorption had been extending and widening, until at last the unfortunate dental practi-

tioner had attempted the extraction, when the remaining shell of cortical bone at the border had given way under the slight force necessary for the removal of the root; hence the "snap" heard by the patient at the time of the extraction.

The patient was held under observation for three weeks and the jaw radio-

used in the event of contraction of the jaw to the side of the operation. They were not used, however, as the patient, who is rather a fine-appearing woman, suffered practically no disfiguration through the loss of this bone; the new growth being sufficient to retain the parts until healing—which was rapid—

FIG. 1.



New tissue.

graphed at intervals. A marked involucrum was rapidly forming beneath the whole of the lower border, so at the end of the third week we decided to take away the sequestrum, which was done February 15, 1919, under ether anesthesia, intra-orally. (See Fig. 2.) Metal splints had been prepared to be

used in the event of contraction of the jaw to the side of the operation. They were not used, however, as the patient, who is rather a fine-appearing woman, suffered practically no disfiguration through the loss of this bone; the new growth being sufficient to retain the parts until healing—which was rapid—

occurred. There was no complication following this operation, the pregnancy going to full term. Certainly in this case an X-ray plate and its intelligent reading were the means of protecting a skilful, conscientious operator from persecution and an endless amount of unwelcome court ex-

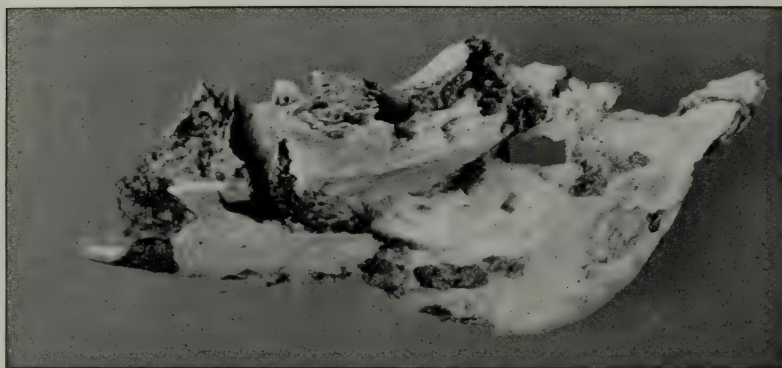
perience (whereas too frequently the accused is held culpable by many people even though the evidence is all to the contrary) by a patient whose trouble was doubtless the result of her own careless procrastination.

I would like, just here, to say a few words in regard to the splendid recognition the Mercy Hospital of Wilkes-Barre has given the work of the dentist in this

cases assigned to them. All cases involving the dental tissues are referred to them at once, and the result has been educational in a high degree to the dental staff—a valuable experience and wonderfully helpful in the private practices of the men who are fortunate enough to have this appointment.

The hospital also conducts a splendid free dental clinic where the children of

FIG. 2.



Sequestrum.

community, as I think it is really advanced, and, I am sorry to say, unusual.

The dental surgeons are taken into the hospital staff on exactly the same conditions and the same privileges are open to them that the medical members enjoy. Every resource of the hospital and operating rooms is shared equally. The pathological laboratory is at their disposal and they are urged to avail themselves of the X-ray department absolutely without restriction for the successful diagnosis and treatment of all

the poor, up to fourteen years of age, are treated. Two social workers investigate the financial status of applicants for treatment and practically prevent any abuse of this splendid charity by people who are able to pay. Dr. Alfred E. Bull is at the head of the infirmary staff.

This hospital deserves the thanks of the profession for this splendid example to other institutions of like character. May many more follow the lead!

76 W. NORTHAMPTON ST.

Dakin's Solution in the Treatment of Pyorrhea.

By L. P. HENNEBERGER, D.D.S., Baltimore, Md.

CAN pyorrhea be cured? This question is most frequently and persistently asked the profession by the laity, and it should be answered neither in the affirmative nor in the negative without due qualifications, and not then until after a most thorough and complete examination and proper study have been made of every phase of the particular case. And even then our answer should be based not alone upon the classic symptoms as manifested in the oral cavity, but should also take into account the systemic phases, if any such accompany this most prevalent disease.

To one afflicted with pyorrhea the question is a vital issue, and it is, to say the least, a questionable procedure on the part of the practitioner to answer the question without due and proper use of the means at his command for a local and systemic diagnosis. If he is doubtful in his own mind as to his systemic diagnosis, he most assuredly should utilize the service of the family physician or someone qualified to make a urinalysis, blood test, and radiographs. With these findings at his command, coupled with his knowledge of the oral conditions, he is in a position in all complicated cases to speak with authority.

We feel that we should be particularly careful, in pyorrhetic work, as to our promises to patients, for as a rule dentists promise too much, and the words "cure" and "guarantee" enter much too freely into their conversation with their patients.

It should be remembered that the word "cure" applied to any disease is but a relative term, and in pyorrhea it most assuredly does not mean that the lost tissue (gingival, pericemental, and

alveolar) can be restored; but it does truthfully mean that the teeth and surrounding tissue, if treated, can be made healthy and comfortable. Teeth that cannot be restored to this condition unquestionably should be extracted. A truly professional man will not promise anything except to do his utmost, and that utmost should have as its prime object the conservation of his patient's health, and restoration of the oral cavity to a hygienic condition.

We have been content to clean teeth in a haphazard sort of way, overlooking conditions in the mouth—directly responsible for future pyorrhea—without making any effort whatever to correct them. The public has actually been taught to think that cleaning the teeth is principally done for the sake of appearance, and that a dollar is a fair price. It is to be regretted that one of the most important, if not difficult, operations in dentistry should be slighted in such a manner.

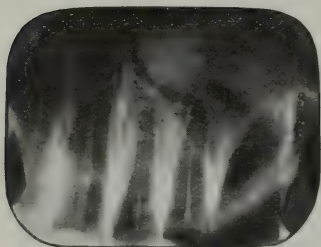
The awakening of the dental profession to the full significance of ailments resulting from pyorrhea really has instituted a new epoch in dental science. As a result of this new epoch, while the effects are treated, the real predisposing causes are given most thorough investigation. Whether they be of local or systemic origin, or both, it is a conceded fact that micro-organisms play a most important part in the disease, for it is said that thirty kinds of bacteria have been found in the oral cavity. In fact, Miller, in his book published as far back as 1890, isolated more than fifty different kinds of bacteria from the juices and deposits in the mouth. The staphylococcus and streptococcus are permanent

residents, the pneumococcus is found in ninety per cent. of persons examined, and other germs are so frequently present as guests that to find them is not at all surprising.

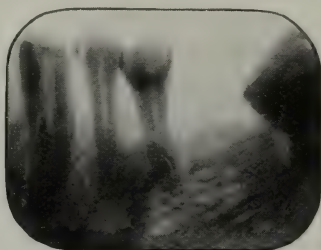
As a rule, these bacteria do us no

ticles of food, cast-off epithelial cells, etc., and usually does no harm; yet it may become the causative factor of pneumonia, may take part in producing pulmonary phthisis, and is one of the invaders in pyorrhea alveolaris as well

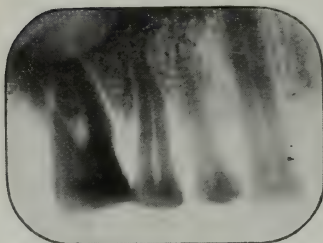
GROUP OF RADIOGRAPHS SHOWING PARTIAL ABSORPTION.



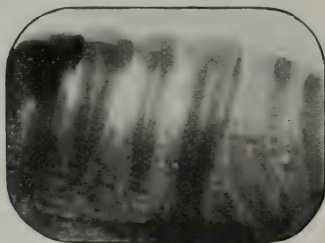
Upper right bicuspid.



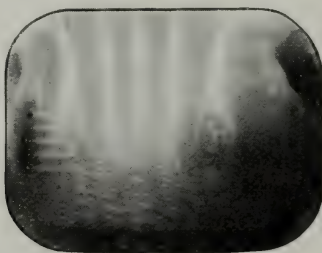
Lower right bicuspid.



Upper left bicuspid.



Lower left bicuspid.



Lower central region.

harm; they live with us as messmates, deriving their sustenance, like dogs, from the crumbs which fall from the master's table. But, like dogs, they sometimes turn and bite the hand that feeds them.

Ninety per cent. of the mouths examined showed the presence of the pneumococcus. This organism lives on par-

as one of the important factors in the production of rheumatic symptoms.

The streptococcus, also ordinarily a harmless saprophyte, may cause oral sepsis, erysipelas, puerperal fever, and septicemia or blood poisoning, streptococcic sore-throat, acute arthritis, endocarditis, and many other affections.

Hartzell's statement "That infection from the teeth and tonsils causes ninety per cent. of all heart diseases, that fifty per cent. of arthritis and iritis is from the same cause, that kidney troubles are frequent from mouth infection," makes it incumbent upon us as a profession to awaken to the importance of the early diagnostic signs and symptoms manifested in the mouth, and the utilization of proper preventive measures. It therefore is just as necessary to health to clean out the mouth thoroughly once or twice a year, and brush the teeth and gums three times a day, as it is to take regular baths and use clean clothes; this should in itself teach us that preventive measures are most essential.

The recognition of pyorrhea in its incipience, by its early classic symptoms, should make us ever watchful to take the following proper preventive steps: Sterilization of the oral cavity; examination of the mouth in a definite manner; observation of the color and condition of gums, mucoid plaques or films and amounts of salivary deposits on the surfaces of the teeth; observation of any malocclusion and inauguration of steps for correction of traumatic lesions caused thereby; notice of ill-fitting crown and bridge work; observation of condition of fillings as to contact, occlusions, overhanging edges and cervical margins; correction of impingement on dental papillæ; radiographing of all devitalized teeth and suspected areas for pockets not self-evident; observation of points of probable parasitic invasion; observation of the systemic condition of the patient.

These simple basic principles are laid down so that prevention may be the rule. Many of us are too prone to await the classic pyorrhætic symptoms before we are willing to admit its existence.

From clinical observation we realize that pathogenic organisms play a most important part in this disease. It was therefore considered advisable to reduce the virility of the attendant pathogenic organisms. For this purpose we found Dakin's watery solution the medium best

suited for the elimination of the bacteria, and it has been used with most gratifying results.

Para toluene-sodium-sulfochloramid, put up under the trade name of Nuklorene, was found to be the most stable and to be the least hygroscopic of any tablets we used for making Dakin's watery solution. It is used by simply crushing a tablet in a given amount of water, making any per cent. solution desired, ready for immediate use. We found that a watery solution of 1:1,000,000 destroyed streptococci in two hours, and 1:500 destroyed staphylococci in two hours, giving it an antiseptic and germicidal coefficient of two hundred times that of phenol in the absence of organic matter, and fifty times greater than phenol in blood serum. One-fourth of 1 per cent. kills streptococci almost instantly; 1:1000 solution is more germicidal than 5 per cent. carbolic acid, and is non-toxic and non-irritating.

The application of the nuklorene solution was accomplished by the use of the Sausser irrigator, designed by Dr. Emerson R. Sausser of Philadelphia, and was of great assistance in our work. This instrument is a glass-barreled syringe into which has been fused a tiny platinum cannula for flooding-out purposes, and is accessible to the smallest pyorrhætic pocket. In all cases the pockets were washed or flooded out with a 1 per cent. solution. The solution can be used, however, up to 4 per cent. without tissue irritation.

We insert the needle to the bottom of the pocket, bringing the solution in contact with the pus organisms. Then we have the patient rinse the mouth frequently at home, using a one-fourth of 1 per cent. solution. The necessary instrumentation was accomplished in the usual manner. The following case is typical, and clearly illustrates the rapidity of action and the success attained in the use of this solution:

CASE. (Patient No. 6; occupation, gardener.) Patient complained of suffering from sore mouth. Teeth covered with deposits of various colors from green to brown: gums highly inflamed and sore to touch. Flow of

pus around necks of teeth. Complained of rheumatic pains in extremities. Has paid no attention to teeth as far back as he can remember, but says they "used to get sore once in a while, and then get better." July 26, 1918, photographed. (Fig. 1.)

The five accompanying radiographs (see page 490) show partial absorption.

Photo taken showing one-half of the mouth cleaned and irrigator in position. The part of the mouth treated shows such an improvement over the other half that they do not

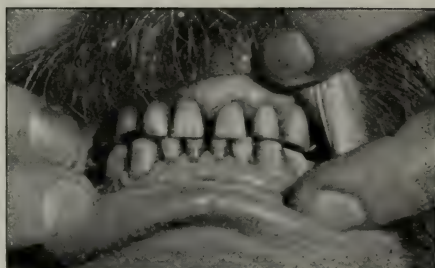
FIG. 1.



FIG. 2.



FIG. 3.



July 29, 1918, began treatment by irrigating with 2 per cent. solution of nuklorene in pockets, and then removing deposits from left side of mouth, upper and lower. Gave patient brush and box of nuklorene toothpowder (1 per cent.), with instructions to brush teeth twice daily.

look as though they belonged to the same person. (Fig. 2.)

Completed case shown in Fig. 3.

318 N. CHARLES ST.

Impression Filler, Surfacer, and Separator.

By RUPERT E. HALL, D.D.S., Chicago, Ill.

PERSISTENT experimentation in the search for a better impression varnish and separating medium resulted in the discovery that the dipping of the impression in collodion produces, we believe, the most perfect and beautifully surfaced impression yet known.

To treat the impression in this manner, secure, as a minimum amount, one pint of flexible collodion (Squibb), and add a little shaving of the lead of an indelible pencil for coloring. Allow the impression to dry for about ten minutes or until the free water has passed away from its surface. Place in the plaster bowl sufficient collodion to permit complete submergence of the impression in it. Dip it into the solution, keeping impression side up. Remove from the solution and stand edgewise to permit excess collodion to drain. In two or three minutes the collodion will dry and the impression be ready for a second dipping. The first coating fills the impression and makes it impervious to the action of the second. The second acts as a varnish over the first, producing a surface as smooth as that of congealed collodion and approaching that of glass.

The solvent of the collodion, the ether, will attack the impression-tray compound material, so it is desirable to remove the impression from the solution as quickly as its surface has received a coating of the solution.

When finished with the solution, pour it back into the bottle, and cork tightly. As the ether, the vehicle of the solution, is highly volatile, it will gradually evaporate as the solution is used, and the solution will become thickened. When too thick add ether, and thin to the desired consistence.

Cleanse the plaster bowl, after using,

before the collodion solidifies; otherwise it will form a hard crust that will destroy the flexibility of the bowl, and when the bowl is forced to bend, the rubber will crack, owing to the adhering unyielding coating of collodion.

Never attempt to paint collodion on the impression with a brush. The ether evaporates so rapidly that it is impossible to apply it uniformly, and it will lap and bridge over the undulations and irregularities of the impression.

Prior to pouring the cast, soak the impression in water to prevent any part of it from absorbing the water from the cast material. Next paint the surface of the impression with soapsuds and rinse off all free soap. The soap will effect easy separation of the impression from the cast. This step is essential, otherwise there is an adhesive tendency between the impression and cast. But be sure to free the surface of the impression of all excess soap by placing the impression under running water, or submerge it in water. Excess soap will produce a defective surface in the cast; the surface will be porous and the quality of the material will be poor. Its action is derogatory to the quality of all cast materials.

The writer's success with the use of collodion, after the manner described, has been so highly satisfactory that he takes pleasure in recommending it as, in his opinion, the one best impression filler and varnisher yet devised. It by far surpasses any other medium and technique with which the writer is familiar, and is a source of satisfaction in his work in daily practice. It gives the finish to a plaster impression, and in turn delivers a smooth, dense cast.

MARSHALL FIELD ANNEX BLDG.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDWARD C. KIRK, D.D.S., Sc.D., LL.D., *Editor.*

L. PIERCE ANTHONY, D.D.S., *Associate Editor.*

PUBLISHED BY THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Virgin Islands, Cuba, and Mexico. Canada, \$1.40. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the EDITOR, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, JUNE 1919.

EDITORIAL DEPARTMENT

The Dental Movement in Great Britain.

IN our previous issue we made brief reference to the Report, then just issued, of the Royal Commission upon the inadequate supply of qualified dentists in Great Britain, the means suggested for their increase and for the protection of the British public against dental practice by unqualified and incompetent persons.

In this issue we publish the report in full, because we deem it to be a document having an interest far beyond that which concerns its local national applications, and an importance in its bearings upon dental activities as a whole which is worldwide.

It will be seen from a perusal of the report that the term "qualified" is used to specifically designate those practitioners who are legally authorized to practice dentistry under the provisions

of the law known as the Dentists Act of 1878. While this law provided in a general way for standards of qualification, these were administered in practice by or under the direction of the General Medical Council, a body of wide discretionary powers. Under the provisions of the Dentists Act about 5000 persons were licensed and their names appear upon the Dentists' Register as "qualified" by the terms of the Act to practice dentistry in Great Britain.

The Act was defective in that while providing the means of qualification it failed to prohibit the practice of dentistry by those who did not comply with its provisions, and under the common law of England one may pursue any business as a means of livelihood unless specifically prohibited by statute. Therefore one may practice dentistry in England notwithstanding the Dentists Act, provided he does not describe himself as "dentist" or "dental practitioner," or use any name or title implying that he is registered under the Dentists Act.

The situation thus created has brought forth some interesting, not to say remarkable results, the primary and outstanding one being the failure of the Act to produce an adequate supply of qualified dentists to meet the health requirements of the British population so far as their teeth are concerned. The law lacking any essentially compelling factor, only a meager number sought the higher levels of practice which qualification under the Act contemplated, and in response to a growing demand for dental service there arose a group of unqualified dental practitioners three or four times as large numerically as the legally qualified group. In this latter group, as the report shows, was a considerable admixture of those who were utterly incompetent, and whose activities were a scandal upon the fair name and reputation of honest and competent dental service. It had the further effect, in our opinion, of creating the belief in the public mind that good dentistry is a luxury only within the reach of the well-to-do. This it did by preventing the growth in numbers of qualified practitioners, thus limiting competition and enabling the favored few to charge whatever fees the traffic would bear. Under these conditions the general public was compelled to resort to the ministrations of practitioners of uncertain status, without standardized competency and authorized legal qualification, or otherwise they were deprived of dental

service altogether, if we except the extraction of teeth and their replacement by questionable artificial restorations. Dating almost from its enactment the British dental law has been under critical examination. Its provisions have been constantly under review in the courts in test cases, and its defects have furnished matter for debate in the British Dental Association meetings and other representative dental gatherings. Efforts have been made to amend the law or to secure legislation that would more adequately meet the national and professional requirements of British dentistry, but without material result.

An historical review of the effort which has been made to establish dental activities in Great Britain on a rational basis in its professional as well as in its public service relations has its parallel in the effort which in the United States was made to create an efficient and self-respecting dental service on a commissioned basis in our army and navy. For sixty years the dental profession through its authorized representatives brought pressure to bear on the Congress to secure that which since the outbreak of the European war has been fully accorded to dentistry as a profession. Our efforts previous to that time were weakened to the point of repeated failure by lack of unanimity of opinion and concert of action. We were hedged round about by the factor of individual selfishness and narrowness of professional idealism. Our demand was made from the standpoint of the professional success we desired to attain for ourselves, and not primarily in the interest of the service of the nation. So also in the case of our professional brethren of Britain, the record of their endeavor portrays the inhibiting influence of the same elements and their operation as factors of discord leading to failure of attainment of their otherwise high objective.

It is not intended to either assert or imply that in either case the lack of recognition of public interest was a defect common to all engaged in the furtherance of these enterprises, but it is clear that when the effort toward the achievement of these higher ends did fail, it failed as the result of the self-seeking tendency as related to the professional group or to individuals of that group. The exigencies of the war compelled a new angle of view. It brought into prominence with insistent force in both instances the necessity for care of the mouth and teeth and the elimination

of dental disease in order to conserve the man power of the nation.

The number of qualified dentists in Great Britain was totally inadequate for the needs of the civilian population, apart from the needs of the army and navy, and the acuteness of the need compelled attention by the Government and the creation of a Royal Commission to examine into and report upon the whole situation. The report is an epoch-making document in that it has originated not in or from the dental profession, but is a governmental inquiry undertaken in the interests of public health. It is therefore divested of all professional bias although it is largely shaped by expert professional counsel and opinion. It represents not what the profession would like to have done so much as it expresses the objects the Government desires to attain in its public health service. It jolts somewhat the sensibilities of those who fear that the carrying into effect of certain of the recommendations will deprive them of their share of the butter they are wont to spread on their bread, or that it may even curtail the ration of bread and butter itself. It also shocks the fine feelings of others who do not like the idea of having their names printed in a register of qualified dentists along with others who have not taken the professional qualification which they themselves spent time, money, and energy to obtain. Nevertheless the Government says in effect there exists a public need, a vital health problem, for the solution of which there is required a reorganization of the whole system of dental service; and necessarily certain individual and professional sacrifices must be made in order that the larger object may be attained. In which point of view there can be no doubt as to the ultimate answer. As Mr. Hopson, in a recent debate before the Representative Board of the British Dental Association, said:

Just as during the war it had been necessary to submit to the curtailment of private and individual liberties in order to achieve a greater freedom, so now the profession was called upon in the national interests to lay aside for the time being some of its cherished professional ideas, but he was confident that they would pick them up again and hand them down to their children enriched, ennobled, and made secure.

It is that sentiment which embodies the broader outlook, the larger ideal—for which reasons it points the way to the greater success. The recommendations of the Commission clearly indicate the intention of the Government to carry the benefits of dental service to the people of the nation. This is the central idea that dominates the proposals for reorganizing dental education so as to increase the annual output of dentists from the schools until the demands for dental service throughout the nation are adequately provided for.

This larger conception of the public service relations of dentistry and its annexation as a public health utility, if it is not an outgrowth of the war is at least a materialization of the war experience. The example set by Great Britain is one which establishes a precedent that must and we believe will inevitably be followed by other nations and states in the near future, and it is well that we prepare for the expansion of dental activity that the movement foreshadows.

Many looking only to their own selfish interests will object to this progressive step on the ground that multiplication of dentists, extension of school oral hygiene and public free dental service, will increase competition and diminish the incomes of private dental practitioners. Horse-breeders years ago protested against the introduction of railway transportation on the analogous ground that it would ruin their means of livelihood, yet experience proved that the railways required in their service more horses than had ever been needed previously. It may be safely asserted that whatever popularizes dental service means a larger material return to those in its practice. This is the answer to the selfish argument, but the extension of dentistry as a factor in the health conservation of the nation is the larger objective which will find a generous response in the minds of all who honestly desire the attainment of success in its altruistic sense for their chosen profession. It is toward such a position that we believe the dental profession of Great Britain is now directing its progress. It is for us to realize the facts in the case and to do likewise if we are to hope to maintain our leadership in dental progress.

PRACTICAL HINTS

This Department specially welcomes the brief presentation by our readers of any novel suggestions or methods which in their own practice have proved to be time-saving or to possess other features of advantage.

Inlay Restoration of Incisal Corners.

By E. G. LEE, D.D.S., Clinton, N. C.

IN making a cast gold anterior corner restoration, cut an appropriate part of a celluloid tooth form, oil it, melt casting wax into it, then place in position on the prepared tooth and hold under pressure while the wax is cooling. Remove the celluloid form, and trim and polish the wax model.

If a pin is used for anchorage, attach

a small amount of wax to the pin before placing it in the tooth, then place the form filled with wax in position, and finish as in the former case. This method results in accurate margins and a well-fitting inlay, and has proved a most satisfactory method of restoring incisal corners.

Why Facings Break, and a Method of Prevention.

By Dr. R. W. BURCH, Fort Lauderdale, Fla.

FACINGS do not ordinarily break from the direct strain of mastication, but usually by reason of the flow of gold under or near their incisal edges. Each impact of the opposing tooth causes a little flow, and the gold immediately under the cusp in its endeavor to expand pries off the facing. This physical process can be compared to the splitting of a solid rock by a growing tree.

Repair can be quickly made by grinding away the gold in contact, and thus removing the cause of breakage. Then with pliers flatten the pins on the bridge,

bending them slightly together. Select a facing, and grind off its pins. Now grind a groove mesio-distally in the facing deep enough to allow it to seat properly, and cement to place. The site of the groove may be determined by carbon paper or wax. If a close fit cannot be had, paint both pins and facing with cement, and use a very thin mix of amalgam as a filler.

This method of repair is not original, as I had occasion to remove a facing which had been repaired in this manner and which had been in the mouth for fifteen years.

REVIEW OF CURRENT DENTAL LITERATURE

[*Proceedings of the Royal Society of Medicine*,
Section of Laryngology, London, December
1918.]

Tooth Plates Impacted in the Esophagus.

The meeting to whose proceedings the above reference is made was in major part a symposium on the removal of impacted plates.

Somerville Hastings reported the case of a male, age twenty-three years. A roentgenograph showed a vulcanite denture at the level of the aortic arch. On the afternoon of the day the plate was swallowed, under cocaine the plate was divided by Irwin Moore's cutting shears into two slightly unequal pieces; both fell into the stomach, and were passed a few days later without difficulty per rectum. This is the first case on record where a tooth-plate has been cut in halves in the esophagus with any cutting instrument. Killian (*Deutsche Med. Wochenschrift*, December 20, 1900) gives a case in which he separated a vulcanite denture into three pieces by burning with a specially devised cauter knife, but this was a most dangerous procedure. The first attempt to cut through an impacted denture with Irwin Moore's shears was made by Peters in 1912 (*Lancet*, London, 1916, i, 996).

Woakes gives a case, male, of fifty-seven years, who six weeks previous to presentation swallowed a portion of an upper partial denture of platinum. Roentgenograph showed it at the level of the aortic arch. Great difficulty was experienced in grasping the plate. On one occasion it was firmly grasped with Irwin Moore's forceps, but since it could not be loosened, it was thought inadvisable forcibly to extract it and risk tearing the esophageal wall. There was much bleeding. Death occurred two days later. At autopsy, the denture was found embedded by two clasps in the anterior-esophageal wall.

There was an ulcerated tract through the esophageal wall into the right pleural cavity, giving rise to a general sepsis, pyo-pneumothorax, and collapse of lung. The perforation was not of recent date.

Tod reports the case of a young man presenting himself the morning after swallowing a small partial denture. There was a certain amount of pain in the neck, and there had been some vomiting while attempting to breakfast. Roentgenograph showed the denture at the upper level of the clavicle. It was easily seen with the esophagoscope; removed under a general anesthetic. Complete recovery.

French records two cases:

Case 1. A man of fifty years had been knocked down and brought to the hospital in a dazed condition. In a couple of hours he recovered his mental powers, then noticed loss of his denture. His sputum was blood-stained. A roentgenograph showed the plate in the esophagus just below the cricoid. Under chloroform, the denture was seen with the esophagoscope. It was seized with a pair of Bruening's forceps, but found firmly fixed. The cricoid was gently pushed forward, and after considerable manipulation, the plate was freed, and removed as a whole. The patient left the hospital two days later, quite recovered.

Case 2. A man of twenty-two years awoke suddenly with feelings of suffocation and alarm. A partial upper denture was missing. Food was vomited in small quantities; breathing was difficult. The patient was suffering from shock; pulse 120; pallid; a rather anxious face. Voice weak and husky. Digital examination over the anterior cervical triangles, in a lateral direction, produced a pricking sensation on the left side of the "throat," caused by one of the clasps. A roentgenograph showed the plate, low in the esophagus, opposite the intervertebral disk,

between the last cervical and the first dorsal vertebrae. Anesthesia was induced by intravenous saline and ether. The plate was seen with the esophagoscope, but it was impossible to move it. A side of the plate was clipped off with Irwin Moore's shears. The denture was removed, a small piece slipping into the stomach. The recovery was complete in a few days.

Kelly reports three cases in which dental plates were removed from the esophagus.

At the same meeting Irwin Moore exhibited "ring forceps" suitable for teeth inhaled with their root directed downward and then impacted, *e.g.* incisors and canines.

[*Semana Médica*, Buenos Aires, July 11, 1918.]

Movement of Eyelid, Associated with Mastication. BY C. S. DAMEL AND A. NATALE.

Reference is made to five cases. It is a very rare condition, because this represents the experience with over 100,000 patients in the Hospital Oftalmológico. The first two were in sucklings, a few months old. The eyelid was affected with ptosis, and at the moment of suction the eyelid was raised. Three cases are given in detail.

Case 1, a boy of five years, of sound parentage, born at term; had suffered no disease up to the present. The abnormality in question was congenital. There was an incomplete ptosis of the right eyelid. Every time the mandible was lowered the eyelid synchronously was raised. When the jaw was moved to the left, the same phenomenon resulted. Deglutition did not influence the ptosis.

Case 2, a boy; the abnormality was congenital, parentage sound, born at term, but with forceps. At the moment of suction or opening the mouth, the eyelid was synchronously raised. It was also the right eyelid in this case which was affected with ptosis.

Case 3, an infant of nine months, entered the clinic for phlyctenular conjunctivitis. The same congenital deformity was seen as mentioned in the above case—ptosis of right eyelid. Every time the mouth opened, the eyelid was synchronously raised. The same thing happened at the moment of suction. The left eye was normal.

The authors give considerable attention to

the hypotheses advanced to explain this phenomenon. A point to be remembered in this connection is the proximity of the nuclei of origin of the motor nerves to the eyelid and the masticatory muscles.

[*Annali di Odontologia*, Rome, January 1919.]

Leptothrix asteroidis. BY JOSEPH MENDEL.

The organism was encountered in a study of pyorrhea alveolaris. In smears, it appears as a mass of bacillary elements grouped in the form of a rosette. It is Gram-negative. Mendel was able to isolate and cultivate this organism, in ascitic-sugar-gelatin or serum-sugar-gelatin, where it appears as a long filament, straight or sinuous, 0.4 micron in diameter and 30 to 40 micra in length. Internally the filaments show granulations, which take the stain more intensely. Branching has never been observed. At the end or along the course of a filament, the rosette formation of rod-shaped elements may appear.

The organism is a strict anaerobe. The colonies first appear on the third day, punctiform, whitish, opaque; on the fifth day, about 1 mm. in diameter. Produces gas, liquefies gelatin; acidifies milk without coagulation; grows slowly on potato; does not ferment mannit; does not digest white of egg; produces neither indol nor furfural.

Subcutaneous abdominal inoculations (apparently in man) of 1 cc. of bouillon culture gave a voluminous edema, with enlargement of lymphatics. Inoculation in the oral cavity, between gum and root, called forth a limited local suppuration, which was cured in eight days.

Mendel believes this organism taxonomic-ally is intermediate between the genera streptothrix and leptothrix.

[*Journal of Laboratory and Clinical Medicine*, St. Louis, November 1918.]

Comparative Values of Some Local Anesthetics. BY HERBERT C. HAMILTON.

This study was called forth in response to Sollmann's work (see COSMOS, March 1918, page 259), which passed over apothesis as of minor importance. Hamilton's paper emphasizes the advantage of this newer anesthetic. Among the laboratory tests that have been devised for the investigation of local anesthetics, there are three, each of which appears to have a very direct bearing on the

clinical application of these substances, namely, the intracutaneous, comparable to infiltration anesthesia; the nerve-trunk anesthesia, comparable to nerve-blocking or conduction anesthesia; and surface anesthesia, the mucosa of the eye, nose, and throat. Laboratory results, it must be remembered, are only suggestive, and do not absolutely demonstrate the clinical value of a local anesthetic. In Hamilton's experiments, the hydrochlorid of each of the local anesthetics tested (cocain, novocain, apothessin, and KCl) were used in every case. No experiments were conducted after neutralization.

The results of intracutaneous administration, on four different individuals, of three local anesthetics (KCl was not used) showed that (1) novocain is about one-half as efficient as cocain, and (2) apothessin is practically equal to cocain in anesthetic value. The results of the nerve-trunk anesthesia test showed the efficiencies of the four anesthetics to be apparently nearly equal. The results of the surface anesthesia test showed novocain and apothessin to be equally effective, *i.e.* about one-third as effective as cocain.

Basing his stand on these results, Hamilton concludes that apothessin is equal to or exceeds novocain as a local anesthetic, and in some respects is not less efficient than cocain.

[*Bulletin de l'Académie de Médecine*, Paris, February 25, 1919.]

Labial and Lingual Cancer in Animals.

By CADOT.

This paper is corroboratory of the excellent article on lingual cancer by d'Arcy Power (*DENTAL COSMOS*, April 1919, p. 343), and as far as concerns the zoölogical distribution of the lesion in question, even supplementary. The clinical and pathological histological researches of the last thirty years have definitely placed lingual and labial cancer among the rarest localizations of carcinoma in animals. The comparative study of these lesions confirms the implication of a *specific* cause in the etiology of the disease in man; this study emphasizes the importance of the action of secondary, predisposing, or favoring causes in the development of cancer.

Labial cancer is of extreme rarity in all species of animals (other than man). Cadot believes that he has observed it in old dogs on the lower lip. In the dog there are also

instances of secondary labial epithelioma. Cancer of the lip is rarer in the horse than in the dog. Froehner describes this condition on the upper lip of a horse nine years old. Nothing is known of labial cancer in other domestic species.

Lingual cancer is not more familiar than labial. In the literature, Cadot found 7 cases—3 in the horse, 1 in the cow, 1 in the dog, and 2 in the cat. To the 3 cases in the horse may be added a fourth, of M'Fadyean (referred to by Power, *loc. cit.* p. 343). Lingual cancer in the horse is localized in a region where the mucosa is rich in fungiform papillæ. It is not seen upon the middle of the organ, nor especially at its free part where most exposed to traumatism. One of the two cases of lingual carcinoma in the cat, referred to by Cadot, was also referred to by Power (M'Fadyean's case). The case in the dog affected an animal of nine years with multiple neoplasms, one at the base of the tongue.

The extreme rarity of lingual cancer of the lip or tongue in animals other than man is undoubtedly open to diverse interpretations, but to attempt to explain this phenomenon simply by reference to a mechanical or traumatic etiology is contrary to fact. The tongue of the lower animals is exposed to traumatism far more than is the tongue of man. This phenomenon is principally due to the absence of syphilitic infection in the lower animals, which virus is one of the most frequent conditions favoring the development of carcinomata in man.

[*Annali di Odontologia*, Rome, February 1919.]

Tuberculosis of Maxillary Sinus. By GUGLIELMO BILANCIONI.

The author gives primarily an extensive survey of the literature upon the various types of necrosis of the maxilla: Toxic, acute—from the infections, especially the exanthemata; chronic—sequent to lues and tuberculosis; and the trophoneurotic type—in *tabes dorsalis* and *dementia paralytica*.

This *résumé* is supplemented by the histories of two cases, which came to Bilancioni's own attention. The first case concerned a woman of twenty-five years. This was of the pure osteogenetic or osteomyelitic type. The second case was that of a girl of fifteen

years, and was of dental origin. The patient came of a tubercular family. The trouble began at the age of twelve. The first symptom was a swelling of the right cheek. This was ascribed to a bad tooth. The maxillary right first and second molars were extracted. Shortly after, the condition was recognized as tubercular caries of the right maxilla. Surgical intervention was contra-indicated, and a course for general reconstruction was prescribed. Some months later the two premolars, loose and devoid of gum, were extracted, along with two sequestra. Two years after the beginning the local conditions were very bad. The excretion was abundant and fetid. Another large sequestrum was removed, containing the alveolus of the canine. The local conditions improved considerably, but a general physical examination showed many signs of tubercular infection. Oral examination revealed, besides the extensive loss of substance represented by the sequestra removed, a communication with the maxillary sinus, irregularly circular in outline and about 8 to 10 mm. in diameter. The mucosa of the sinus was seen to be covered with granulations. There was a continual purulent discharge.

In connection with this case, the author uses the term "of dental origin" purely in a topographical significance, without definite connotation that the lesion was initiated in the strict sense from the teeth themselves.

[*Laryngoscope*, St. Louis, March 1919.]

Tic Douloureux with Special Reference to Treatment by Alcohol Injection. By E. R. FAULKNER.

During the last four years Faulkner has had experience with 24 cases. Of these 14 (including one injection of the Gasserian ganglion) were successful. He attempts in every case to introduce the alcohol within the nerve sheath. In such cases the results are better, in some with even a prospect of permanent relief. No anesthesia is necessary; cocaineization of the skin suffices. A special needle, 3 inches long and 1 mm. in diameter, with an abruptly beveled end, containing a small stylet, is inserted until the nerve is touched; then pushed forward a slight degree until it is buried within the substance of the nerve, and 4 or 5 drops of 2 per cent. cocain is injected. If immediate anes-

thesia results, inject 8 to 10 minims of 85 per cent. alcohol. If immediate anesthesia does not result, the needle is not within the nerve sheath, and another trial must be made. More than three or four trials should not be made at the same sitting. The directions and details of landmarks are superfluous, as they vary greatly in individuals. One can only learn this part of the work by practice on cadavers.

Of the 14 successful cases, 10 have been free from pain ever since, a time varying from four years to one month; four cases have had relapses.

Among the untoward results, a slight hematoma after injection of the second division of the fifth cranial nerve is common, but is soon absorbed; paralysis of the sixth nerve occurred in 1 case, but disappeared in a few weeks; in Faulkner's single ganglion case, a severe keratitis developed six weeks after injection, recovering in three months, leaving some opacity of the cornea. This can be avoided if the patient will keep himself under periodic observation of an oculist for the first three or four months.

The logical conclusion from a review of all methods and treatments would seem to be that in all cases medical treatment should be tried. Not much result can be expected from it in the early stages. Cases should be examined by a competent dentist and rhinologist, and any peripheral infectious focus should be treated at once.

[*Bulletin de l'Académie de Médecine*, Paris, March 4, 1919.]

Osseous Demineralization and Its Treatment. By ALBERT ROBIN.

This study is of interest because the factors controlling the deposition of mineral salts in the body are *a priori* universally applicable, whether in bone, dentin, or enamel. Cases of failure of fractures to unite afforded the stimulus and the data for this investigation. In the first place, the author attempts to enumerate the condition, already known, in which a demineralization occurs. Such conditions are certain infectious states, dyspeptics' troubles, other alimentary and nutritive vices, and lesions of the nervous system.

Among the infections are mentioned tuberculosis and syphilis. In the adult, in the secondary state of lues, the patient elim-

inates more calcium, phosphates, and magnesium than the healthy individual. Under mercurial treatment the calcium demineralization is accentuated. In the tertiary stage demineralization decreases or disappears. Among the dyspeptics' troubles may be mentioned hyperacidity and acid fermentations. The ingestion of acid products or of foods capable of yielding acids in metabolism (e.g. excess of meats and sometimes an excess of bread) is given as an instance of a nutritive vice. The effect on the nervous system is illustrated by the frequency of fracture on the affected side in hemiplegia, the osteotrophy of Charcot in ataxia, and experimentally by section of the sciatic nerve in animals.

In the treatment of osseous demineralization, at the least the following conditions must be met:

(1) It is necessary to furnish the organism with the mineral elements which it loses in excess, and which consequently are borrowed from the osseous tissues of the body. But the introduction, pure and simple, of these mineral elements, does not suffice. The choice of foods lies among those which are richest in mineral principles—phosphates, calcium, magnesium, and silicon.

(2) To suppress the causes leading to demineralization it is necessary to reduce the formation of acids in the organism (treatment of acid dyspepsias and gastric stasis giving rise to fermentation); to give food favoring less acid products (no organic acids, little animal food, and little bread); and to saturate by alkalis and the alkaline earths (sodium, calcium, and magnesium bicarbonate) the gastric contents at the end of each meal.

(3) In order to assure the assimilation of mineral principles contained in food or in medicaments a diet must be given rich in ternary matters, choosing those most readily digested by the individual patient, seeking to assure their assimilation and oxidation. Assimilation can be furthered by regulating intestinal function and reawakening hepatic activity by hygienic means and suitable drugs. Oxidation can be raised by regular exercise, continual aeration, and massage.

(4) In cases of demineralization of nervous origin it is desirable to use glycerophosphate of calcium, because it favors the

assimilation by the nervous system of alimentary phosphates, and moderates the nervous disassimilation, acting on this system as an agent economizing nervous energies.

(5) It is necessary, furthermore, to use as adjuvants substances possessing properties favoring assimilation and integration of ternary matters and moderating mineral disassimilation, e.g. cod-liver oil and the organic arsenicals.

[*Laryngoscope*, St. Louis, March 1919.]

Vincent's Angina. By H. A. KIEFER.

The author has had quite good results in a limited experience, from the daily application of a 3 per cent. zinc chlorid solution, swabbed on the affected parts once daily, together with a mouthwash and gargle and nasal douche or potassium chlorate solution, 5 to 10 grains to the ounce, every two or three hours, and potassium iodid 5 to 10 grains three times daily internally. Supporting treatment of iron, arsenic, quinin, and strychnin are usually given in combination with the above.

[*Annali di Odontologia*, Rome, March 1919.]

Experimental Studies on Pyorrhea Alveolaris. By JOSEPH MENDEL.

Mendel limits his consideration to the action of anaerobic bacteria in oral suppurations, especially pyorrhea alveolaris. He has isolated a number of organisms, some already known, and some not hitherto described. The experimental animals were rabbits and guinea-pigs, usually the former. Four species of micro-organisms were injected (a) subcutaneously in the abdominal region, and (b) into the periodontal membrane. The subcutaneous injections for the most part called forth no appreciable local effect. In the oral cavity, however, the injections were always followed by an acute inflammatory reaction, accompanied with suppuration, at times in the form of an abscess, at others as a clinical pyorrhea.

The organism whose injection was followed by the most typical case of "pyorrhea," was the *Staphylococcus parvulus* (Veillon), found constantly in the twelve cases of pyorrhea studied. Histological examination was made in one case. Mendel states that the findings were identical with the lesions characterizing the condition in man and dog. This cannot

be meant literally, because the periodontal structures affected are entirely different in the rabbit and in man. The rabbit's incisor (and Mendel's illustrations show that it was along the labial side of this tooth that the injections were made) is absolutely devoid of a periodontal membrane as we know it in man or dog—a fibrous, innervated, vascularized organ of attachment. Mendel does

find a necrosis of the soft tissues along the line of his inoculation, an hypertrophy of the squamous epithelium, and sequestrum formation of the alveolar process. But the validity of this parallelism breaks down on account of the essential difference in the mode of attachment and implantation of the rooted human tooth and the rootless, permanently growing tooth of the rabbit.

PERISCOPE

Diseased Pulp.—Diseased pulps give rise to our greatest problems. Whatever the evidence given by the radiograph, we may be sure that when opening the pulp chamber results in a discharge of foul gas and pus, the condition must be met with surgical procedure.—JOHN E. NYMAN, *Journal N. D. A.*

To Drill Cavities in Porcelain Teeth.—A diamond drill of good quality is not easy to obtain, and requires great care in its use to prevent destruction. To cut cavities without a diamond drill I would suggest the use of a paste made from corundum powder, turpentine, and camphor. After the pit has been cut with a barrel-shaped miller stone, fill it with some of this paste, and with a copper mandrel of the desired size, drill two retaining points.—F. W. F., *Pacific Dental Gazette*.

Crowns as Used by Spies.—A daily paper reports a curious incident in connection with the capture and execution of a certain German spy. He had been shot, and the usual formal post-mortem examination was held. This provided convincing proof of the spy's absolute guilt—if it were needed. The spy had a gold crown upon one of his teeth, and this was found to be hollow, and to contain a micro-photographic code message, which had to be photographed and enlarged before it could be decoded successfully. Banded crowns have been suspected of being the harbingers of many deadly messengers, but we doubt whether such a content as this had ever been thought of before. The possibilities of the removable crown are evidently more dangerous than we had taken to be the case.—*British Dental Journal*.

Amycain.—*Amycaine* is a new French analgesic. The drug shows a complex composition, but is a definite chemical compound of the bi-hydrochlorid of novocain and amylin. The advantages which as a local analgesic it is stated to possess over novocain alone appear to be due to the introduction of the amylin molecule, which chemically is di-methyl-amino-benzyl-pentanol. These advantages refer to its rapid action, to its freedom from irritating action when injected into the tissues, to its widespread effects, and to its minimal toxicity. Further, it is said to be stable and unchanged by sterilizing, even when done repeatedly. Amycain is prepared in a physiological saline solution, sterilized by heat and not by filtration, and adrenalin added.—*Brit. Journ. Dental Science*.

Cancer of the Mouth.—Cancer of the mouth occurs more frequently in men than in women. The great majority of persons suffering from malignant lesions within the mouth have all their lives been unsanitary or careless in the care of the mouth and teeth. Indifferent dental work or rough teeth causing continued irritation has been found to be a predisposing cause in many cases of mouth cancer, for the disease begins exactly at the site of the area which has been subject to a continued irritation.

Permanent bridge work and poorly-fitting plates permitting the retention of food and irritation to the gums are also factors in the development of malignant disease in the mouth. The removable bridge is best, and great care should be taken by dentists in properly fitting and adjusting plates.—WM. L. CLARK, *Dental Summary*.

Advantages Claimed for Removable Bridge Work with Cast Clasps:

(1) An appliance that can easily be removed and cleaned by the patient.

(2) No grinding of enamel, except a small place for the lugs, and no devitalization of pulp.

(3) Can be constructed with a minimum of nervous strain to the patient and dentist.

(4) Has a maximum of stability and food-grinding surfaces.

(5) There is nothing to irritate the gums.

We would not think about putting a removable bridge of this type in for a person who does not brush his teeth regularly and carefully. There will be no decay where the teeth are kept clean. If a cavity should result from the clasp it can be easily repaired by the many methods we have at our disposal.

—R. M. OLIVE, *Dental Summary*.

Extraction of Impacted Third Molar.—

The method which I employ for the removal of lower impacted third molars is as follows: With a blunt dissecting instrument, dissect the gum tissue, exposing the bone; then employ a drill in a strong engine at a low speed. Insert it on the buccal side along the axis of the root, remove and insert it again slightly at the side of the first hole made, then connect the two canals. Follow this procedure until the socket is enlarged two-thirds the circumference of the tooth. Insert an elevator and loosen the tooth. If the socket is not large enough to permit of the removal of the tooth, enlarge the socket with a surgical bur, or half-round chisel. With this method, the minimum amount of bone is destroyed. The severity of these cases depends entirely upon the degree and depth at which the tooth is lying, also the density of the surrounding bone.—H. R. FRANCIS, *Dental Summary*.

To Clean Chamois Skin.—In a suitable vessel place a weak solution of sodium hydrate, and add to this some soap solution. Throw the chamois into this, let soak for two or three hours, and then rub it clean. Rinse in clean tepid suds, wring out, wrap in a cloth, and dry quickly. When dry, rub together or brush with a stiff brush, to restore softness.

Another method is to rub the chamois thoroughly with soap, then allow it to remain for two hours in a weak, warm solution of sal soda, and rinse until clean. Instead of rinsing in clean water and removing all traces of soap, rinse in a weak, soapy solution of soda such as was used for washing in the first place. It is the soap left in the leather by

the rinsing solution that keeps it soft and smooth. After rinsing, wring out the leather in a coarse towel and dry quickly; then brush well, and pull and rub it thoroughly in the hands. If this method is followed carefully, the leather is said to come out soft and pliable.—*National Druggist*.

Pulp Removal.—The safest method of pulp removal is by local anesthesia, either by injection or by pressure. Pulp tissue removed by these methods need not be contaminated with irritating drugs, nor need the periapical tissue be injured from their effects. The use of arsenic trioxid should be discouraged. If arsenic were only used as an obtundent for making possible a painless exposure of the pulp, there would be very much less danger of injury to the periapical tissue. For this purpose it should never be left in a tooth over forty-eight hours, and often only twenty-four hours. Drugs for use following pulp removal should be limited to the least irritating anodynes of the essential oils or their derivatives, preferably oil of cloves or eugenol. The root should be filled after pulp removal as soon as all the pulp tissue can be removed, the canal enlarged sufficiently to give access to the apical foramen, the canal dry, and no pericementitis present. This may be at the second sitting, or it may be necessary to extend the treatment over several sittings before the canal is ready for filling.—EDGAR D. COOLIDGE, *Journal N. D. A.*

Nitrous Oxid-Oxygen Anesthesia for Difficult Extractions.—

In selecting an anesthetic agent for extraction operations, it should be one that will produce anesthesia in a reasonably short time, insure a rapid recovery following its withdrawal, and exert no harmful effects upon the vital centers and organs of the body. In nitrous oxid-oxygen, we have an agent which fulfils these requirements. Being practically non-toxic and non-irritating, it is possible to administer it with comparative safety to patients with diseased organisms without increasing the pathological conditions. It is the safest and most flexible anesthetic in the hands of a skilled operator, and history has proved that nitrous oxid alone has been remarkably safe, even when employed by the inexperienced. It has been condemned mainly by those who are pessimistic of all things progressive, and those men whose entire instruction was obtained from the salesman who sold them a gas apparatus.

There have been numerous and varied developments of anesthetic agents since the discovery of nitrous oxid, but the psychic, as

well as the pathological conditions govern the employment or enhance the value in many instances, whereas nitrous oxid-oxygen anesthesia is limited practically by the skill of the anesthetist, and will reward the efforts made to master its peculiarities with the most universal success and satisfaction.—H. R. FRANCIS, *Dental Summary*.

Root Resection.—Root resection, I believe, lies in the realm of what we might call conservative surgery, whereas tooth extraction belongs to destructive surgery. The root of a lateral incisor, with a history of a number of years of infection, which I resected fourteen years ago, disclosed no infection in a radiograph a week ago, and was firm in the mouth. There had been no recurrence of the discharge, and there were no signs of the systemic effects of an inclosed infection.

As to the technique of root resection, the apical section of the root-canal is filled, but whether or not it is filled quite to the apex I do not care. Then the root-canal is reamed out as far as possible with a No. 3 or No. 4 root-canal plugger. This section of the root-canal is filled with copper amalgam, for, as one cannot cut across a gutta-percha root filling without dragging the gutta-percha away from one side of the root-canal, it is necessary to have a copper amalgam root-filling at the plane of resection. Root resection sometimes fails because of residual infection lodged in irregular tubuli and lacunæ. Therefore I paint the resected root surface with a strong solution of silver nitrate. The bone cavity is then washed out with an aqueous solution of iodine. A blood-clot is allowed to form, and the incision flap is sewed together. Radiographs of these resected areas, it must be admitted, are not encouraging. There is always shown evidence of an apparent infection and rarefaction of the bone tissue, probably due to the fact that the secondary bone tissue does not organize so completely as the original tissue.—JOHN E. NYMAN, *Journal N. D. A.*

Pulp Capping.—The writer has been cautiously testing out pulp capping in selected cases in young teeth, meaning patients under fifteen and having a healthy and vital physical endowment. Successful experiments, during the past two years, in about ten cases,

tempt one to extend the treatment beyond the age of fifteen, always remembering that the older the pulp the less the chance of success with pulp capping.

The method is as follows: The decalcified dentin must first be treated with oil of cloves (the active principle of which is said to be eugenol) for at least two weeks. This both sterilizes and hardens the decalcified dentin. The dressings should be sealed in with one of the temporary cements. If all seems propitious after two to four weeks, the tooth is isolated with the rubber dam, thoroughly dried with hot air, and a paste, made of zinc oxid and oil of cloves, spread over the floor of the cavity. This is covered with a concaved metallic cap, preferably of iridio-platinum. This concaved cap is filled with the paste and carefully placed in the cavity, so as to bridge over the possible point of exposure of the pulp, and thus serve as a protection against masticatory stress. This cap also prevents the admixture of the oil-of-cloves paste with the oxyphosphate. Over this metallic cap is placed a covering of oxyphosphate cement, mixed to a dough-like consistence, and carefully packed in the cavity and against the side walls.

Two points are to be accentuated. First that this method is only recommended in cavities where the decalcified dentin overlying the pulp is in the form known as leathery decay. A pulp underlying truly carious and fully disintegrated dentin is not a "good risk," as our insurance friends would say. Second, as much of the decalcified dentin must be removed as can be removed without exposure of the pulp. This particularly means that small spoon excavators should be carefully used around the periphery of the cavity, completely removing all decalcified dentin from the juncture of the enamel and dentin immediately under the cusps. Occasionally it will be safer to leave this until after the cement has set, as at that time it can be removed without danger of peeling up a layer that will extend across the floor of the cavity, and perhaps expose the pulp, causing it to bleed. But before placing any permanent filling, all this decalcified dentin under the occlusal enamel must be removed, so that the true limitations of "extension for prevention" principles may be indicated.—*Dental Items of Interest*.

OBITUARY

Dr. Wm. Rabun Chaplin.

[SEE FRONTISPICE.]

DIED, in Savannah, Ga., of pneumonia, January 18, 1919, WM. RABUN CHAPLIN, D.D.S.

Dr. Chaplin was the son of Wm. F. and Elizabeth B. Chaplin, and was born in Savannah, Ga., December 24, 1868. His early education was acquired in the public schools of his native city. After receiving his diploma from the high school he matriculated in the dental school of the University of Pennsylvania, graduating from that institution in June 1898 with the degree of Doctor of Dental Surgery. He at once returned to his native city and began the practice of his profession, which he continued with increasing success up to the time of his fatal illness.

The writer esteems it as a special privilege to have had the close, intimate friendship of Dr. Chaplin from the first days of his novitiate as a dental student up to the termination of his life's career, and it is with a deep sense of satisfaction that he can testify from personal experience and observation to the remarkable character of the subject of this sketch.

Dr. Chaplin impressed everyone even at a first meeting as being an unusual man. There was an indefinable something that radiated from his presence and manner that impressed everyone with whom he came into contact. More intimate acquaintance revealed the sweetness and generous sympathetic quality of his nature and explained in some degree the attractiveness of his personality. In early youth he had survived an attack of infantile paralysis, which left to an extent its legacy of physical disability from which he had suffered more or less throughout the remaining years of his life, an experience that must have served to more highly develop that fineness of sympathy for others who suffered that was his dominant characteristic.

He was the soul of honor in all the rela-

tions of life. Possessed of a high idealism that impelled him always to do and to be his best, with the habit of instinctively seeing the best in his friends, whom he cherished with a loyalty and affection which was unshakable, his loss will be mourned by a wide circle of those who in the many relations of life had reason to admire and to love him.

Dr. Chaplin was a skilled dentist, an active student of the principles and practice of his profession, in which his interest was a never-failing one. He kept abreast of the new advances in dentistry, bringing a trained and judicial mind to the solution of the problems which confronted him in his professional work, and he brought a highly skilled technique to the execution of his operations in practice. Judged by the best standards, his life as a man and as an exponent of his profession, brief though it was, must be characterized as a success.

Dr. Chaplin was a member of the Edward C. Kirk Dental Society, the Georgia State and First District Dental Society of Georgia, of which latter he was president at the time of his death. He was a Mason, a member of Solomon's Lodge, and a member of the Hussars Club.

Dr. Chaplin was unmarried. His remains were interred at Laurel Grove Cemetery, Savannah, Ga., January 19, 1919.

"In Memoriam" Resolutions.

Dr. Vance W. Bliss.

THE following *in memoriam* resolutions on the death of Dr. Vance W. Bliss were adopted by the Santa Cruz (California) District Dental Society at its monthly meeting in March:

Whereas, in the providence of an all-wise Creator, our fellow member, Dr. VANCE W. BLISS, was taken away in his early youth; and

Whereas, his ability and skill as a practitioner, his keen interest in professional af-

fairs, and his exceeding affable disposition, make us keenly feel his loss as a member of the dental fraternity; and especially of this society; and

Whereas, we highly appreciate his noble and patriotic spirit in giving his services in benefit to his country; be it therefore

RESOLVED, That we, the members of this society, feel deeply his loss, and hereby express our appreciation of his worth as a

member of our society, and our sorrow over the untimely close of a career which we feel sure would have been full of success; and be it further

RESOLVED, That a page on our minute book be set aside, and the secretary be instructed to inscribe thereon these resolutions, and that a copy be sent to his parents, also to the professional journals for publication.

C. E. BALZARINI.

DENTAL LEGISLATION

Maine Dental Law Providing for Dental Hygienists.

SECTION 2 of the Maine Dental law providing for Dental Hygienists, as approved April 7, 1917, and published in the DENTAL COSMOS for February 1918, has been amended as follows:

SEC. 2. No person shall enter practice as a dental hygienist in this state until she has passed an examination given her by the Board of Dental Examiners of this state, or a sub-committee of said board which it may appoint, under such rules and regulations as it may deem fit and proper to formulate. The fee for said examination shall be ten dollars, and any applicant failing to pass said examination shall be entitled to one additional examination without further cost. The fee for each re-examination after the first shall be five dollars. The said Board of Dental Examiners shall issue certificates of ability to practice as dental hygienists in this state to those who have passed said examination, which certificate shall be displayed in a conspicuous place in the room or rooms in which she practices; *provided*, however, that no person shall be entitled to such certificate unless

she shall be eighteen years of age, of good moral character, and shall have had an education equivalent to that attained by one year's attendance upon the class A high schools of this state as defined by section seventy-three of chapter sixteen of the Revised Statutes, and unless she is a graduate of a reputable training school for dental hygienists or shall present a sworn statement by a dentist licensed to practice dentistry in his state that she has completed a course of at least six months' training as a dental hygienist under him. Said certificate shall be considered a license to practice as a dental hygienist in this state, except that it shall be unlawful for any person to practice as a dental hygienist in this state in any year after the year in which said certificate is issued to her unless she shall pay to the treasurer of the State Board of Dental Examiners on or before January 1st of said year a fee of one dollar, for which she shall receive a registration card, which card shall be placed beside or attached to the certificate above mentioned.

Approved March 8th.

ARMY AND NAVY DENTAL NEWS

Mare Island Dental Facilities.

By LIEUT.-COMMANDER J. L. BROWN, D.C., U. S. N.

[From *The Short Circuit*—Mare Island sailors' monthly.]

ONE section of the Medical Department concerning which little is known is that operated by the dental officers and their assistants. Fine equipments and skilful service are accepted as a matter of course, and, unlike the architect, whose edifice stands as a monument to his skill and ability, the work of this section of the medical department remains veiled in the patient's anatomy, and the patient's expressions of the recollections of buzzing burs, whirling stones, and the painful punches of sharp probes seem to be the only compliments paid to the skill and ability of the most highly developed specialty that the practice of medicine and surgery has produced. This section of the medical department has played a great and important part in maintaining and preserving the health and efficiency of the personnel, and the records of this and other stations only emphasize its necessity as well as having demonstrated its influence upon health and comfort.

The beautiful and modern equipments, as well as the location and buildings in which the dental infirmaries of this station are installed, are the result of earnest and concerted effort on the part of the Yard Surgeon and the co-operation of the dental officers. The increase in the dental personnel and its systematic operation has been accomplished through the experience of long service by the head of this department, developing a dental service and equipment second to none.

When the United States became engaged in the present war the dental service at this station consisted of one standard dental equipment and one dental officer. This office was located in building 172, in a small back room, poorly lighted and ventilated, next to the old yard-craft pay-office, and was installed some time in the early part of 1913. The single dental officer served professionally the entire personnel of this station, including the Hospital, Marine Barracks, Naval Prison, and visiting ships.

Various attempts to improve and enlarge this dental service failed until some time subsequent to the entry of this country into the present conflict, but every effort was exerted to use all available equipment, and the work was facilitated by pressing into service some old equipment long since abandoned and almost useless. A requisition at length furnished a fountain cuspidor, electric engine, and a few instruments, which rendered it more or less useful.

Following the receipt of two new standard dental equipments the Yard Dental Office was installed in the new building No. 217 in the rear of the Yard Dispensary, and for some time maintained two operating rooms. Following closely upon this improvement the Dental Office, Marine Barracks, was installed in the new sick quarters at that post, only one equipment being approved at this time. It was not long, however, until this infirmary was enlarged by two chairs by the use of one of the equipments at the Yard Dental Office.

By this time it was imperative that the Dental Office, Naval Training-camp, still located in the old building No. 172, be enlarged, and another requisition furnished two beautiful modern equipments for this purpose. These were installed temporarily in a room adjacent to the original dental office, in which the old yard-craft pay-office had been located. At this time the present addition to the sick quarters at the Naval Training-camp was under construction, and when completed this office with both old and new equipment was moved into its present light and spacious location.

The increase in the personnel of the Naval Training-camp and Marine Barracks, as well as the Navy Yard personnel, coupled with that from visiting ships and ships fitting out, rendered it imperative that a still greater increase in the dental facilities of this station be secured. Accordingly, requisitions for five complete standard equipments were submitted

and upon their receipt were installed. The old and improvised equipment at the Naval Training-camp office was replaced by the new, thus fully and adequately equipping this office as a four-chair infirmary. The Marine Barracks Office was likewise enlarged to a four-chair infirmary and the Yard Dental Office re-equipped, refitted, and afforded two operating rooms. In order to relieve the main operating rooms of some of the strain of routine examinations and emergency work, the Naval Training-camp was supplied with a new portable equipment for use in the detention barracks. The Marine Barracks Office was also supplied with a portable equipment for use in the Recruit Depot, where much of the original examination and treatment received its initial attention. An additional portable equipment was also secured for use aboard visiting ships, thus relieving the Yard Dental Office of a great bulk of work that greatly interfered with the regular conduct of practice at this office, and affording a great convenience, as well as accomplishing much for visiting ships that heretofore they were unable to secure. By using the remaining two field equipments, when they are not in use in the detention camps, it is possible to afford as many as three visiting ships such service.

While the dental office at the Naval Hospital at this station is not a part of the Navy Yard dental equipment, yet it has proven an important factor and great assistance, not only to the various dental offices of the station but to the entire personnel of this district. As this hospital is more or less the clearing-house for all hospital patients of this coast, including the fleet, Guam, Samoa, the P. I.'s and Asiatic fleet, it is obvious that the dental office therein in its turn likewise receives a large number of cases impossible for out-stations and ships to properly care for. This office has a beautiful equipment, including facilities for all kinds of anesthesia, both local and general, and has accomplished a great deal more for the naval personnel than mere words can record, and the X-ray equipment at the hospital has greatly facilitated the dental operations of the entire station.

The office of the senior dental officer is located in the Yard Dental Office, as also is the dental storeroom. This office, under the direction of the Yard Surgeon, handles the executive work incident to this section of the Medical department, as well as caring for the property and issuing of supplies. To facilitate the work of the dental surgeons the various dental offices are designated as the Yard Dental Office; Dental Office, Naval Training-camp; Dental Office, Marine Barracks, and, as an adjunct to the Dental Office,

Marine Barracks, there is being an office established in the Naval Prison.

The Yard Dental Office is located near (in building 217) and operated in conjunction with the Yard Dispensary, and is known as the "Yard Dental Office—Telephone No. 83." This office attends the personnel regularly attached to the Navy Yard, including yard craft, and cares for the emergency work required by the personnel attached to such ships as may be here from time to time.

The Dental Office, Naval Training-camp, is located in and operated in conjunction with the Sick Quarters, Naval Training-camp, and is known as the "Dental Office, Naval Training-camp—Telephone No. 22." This office attends the personnel attached to the training-camp, including the electrical school, artificer school, and the receiving ship.

The Dental Office, Marine Barracks, is located in and operated in conjunction with the Sick Quarters, Marine Barracks, and is known as the "Dental Office, Marine Barracks—Telephone No. 42." This office attends the personnel attached to the Marine Barracks, the Recruit Depot, and the Naval Prison.

These offices are open during the yard office hours, and the dental officer of the day keeps watch during yard office hours on Sundays and holidays, at the Yard Dental Office. As the dental officer of the day does not remain on the station after yard office hours, it is necessary, when his services are required at such a time, to communicate with the medical officer of the day at the Yard Dispensary, who will notify him to come to the Yard Dental Office.

The clerical work of this department was found to be quite difficult, due to the fact that the dental records are incorporated in the health records, and, as the various offices are so distant from each other, it was found advisable to have all the dental records detached from the health records and turned over to the dental offices. Whenever a health record arrives at the station the dental record is detached and turned over to the proper dental office, where it remains until the patient is transferred. If the record has not been opened, or shows the patient to be in need of dental treatment, the patient is sent for, examined or treated, and the proper entry made upon his record when it is placed on file. When a man is transferred, the medical officer sends to the dental office for the record and reinserts in it the health record. This system places the responsibility with the medical officer concerned as far as furnishing the dental record to the dental offices, as well as for its return to the health record. It also places the responsibility upon the dental

officers for its operation and preservation, and saves both the medical and dental officers a great amount of inconvenience. At the Yard Dental Office this system cannot be followed, as the personnel attended there comes from various places, their health record not being retained at a central location. At the Dental Office, Naval Training-camp, and Marine Barracks, a hospital corpsman is detailed to keep the dental records, make appointments, and keep the data for the reports, and at the Yard Dental Office a yeoman (F) who is an experienced dental assistant cares for the dental records, appointments, and reports therein. The executive dental officer consolidates the reports for the entire station and renders the local personnel, linen, and statistical reports required by the Yard Surgeon. A monthly linen report is submitted to the Yard Surgeon and records the number of operating gowns and towels received from and returned to the central linen room. A weekly personnel report is also rendered to the Yard Surgeon and records the names and locations of all dental officers, hospital corpsmen, and yeomen on duty in this department. In addition to the regular Form K-dental required by the Bureau of Medicine and Surgery, an additional "sanitary report," or statistical report, is furnished the Yard Surgeon for incorporation in his sanitary report, and it is worthy of mention that this report brings out some unique facts.

From January 1, 1918, to December 31, 1918, inclusive, the statistical reports show a total of 30,232 dental operations, exclusive of 3186 operations performed for the personnel of visiting ships, consisting of 4610 extractions, 16,045 restorations and 9577 treatments. There has been an average complement for the year for the entire station of 7325 men, exclusive of those from visiting ships, which means that the rate per thousand of dental operations has been 4127.23, or, in other words, there have been four dental operations performed for every man passing through this station. This fact, in its turn, means that the great majority of men passing through this station were in urgent need of dental treatment. It is obvious that there were some who possibly did not need dental attention, and that there were others who did need attention that failed to receive it, and a great many who received far more than four operations. The law provides for a Dental Corps, as a part of the medical department, at the rate of one dental officer per thousand naval personnel: this station has had for 1918 twenty-four dental officers operating in the different dental offices for approximately 2800 operating days, which

means that the average number of operators for the year reached about seven. When it is considered that these seven operators performed for the station alone 30,232 dental operations (about 359 per month), and in addition a total of 3186 operations for visiting ships, plus the care of their equipment, records and reports, it signally marks the earnest effort and devotion to duty of these officers as well as demonstrates that the legal ratio of one dental officer per thousand permits only a small percentage of the necessary dental requirements of the navy to be accomplished.

This offspring of the Medical department, like its parent, has long since proven its usefulness and good influences, and being a part of the Medical department, the service it affords is free to the active list of the naval personnel, and they are urged to avail themselves of it and abide by its teachings, remembering that "A clean tooth never decays," and that decayed and abscessed teeth undermine health and efficiency.

Awarded Distinguished Service Cross.

FIRST Lieut. Robert E. Motley, Dental Corps, 125th Infantry, was awarded the distinguished service cross, for extraordinary heroism in action near Chateau Thierry, France, July 31st to August 7th, and near Verdun, France, October 14 to 16, 1918. Realizing the need of medical attention at the front, Lieutenant Motley went beyond the scope of his duties as dentist by advancing with the infantry and establishing and maintaining a dressing station with the leading elements of his command. For seven days, from July 31st to August 7th, he safely evacuated many patients by his prompt and fearless action. He again volunteered and went forward in the attack of October 14th to 16th, and on the latter date carried a message back to the supply officer requesting food for the men. Although wounded and badly gassed, he accomplished his mission, refusing evacuation until the food was started for the lines.—*Army and Navy Register*.

Publication of MSS. from Medical Corps, U. S. Army.

IN the circular memoranda for Editors of Medical Publications issued by the Surgeon-general's Office on March 27 and May 22, 1918, it is required by paragraph 423, Manual of the Medical Department, that all medical manuscripts by medical officers, U. S. Army, intended for publication, shall be first sub-

mitted to the Surgeon-general's Office, Washington, D. C., for approval. This regulation, which has been very courteously complied with to date, is still in force as far as medical officers on active duty are concerned. In the case of medical officers recently retired from active duty it is requested, as a courtesy to the Surgeon-general and in aid of assembling material for the Medical History of the War, that all medical manuscripts based upon military or official records, or upon military experience during the war, be submitted as heretofore to the secretary, Board of Publications, Surgeon-general's Office, Washington, D. C., for record and approval, and that such manuscripts be accompanied by a carbon copy. Upon approval, the original copy will be forwarded to the journal designated, for publication, and the carbon will be filed in the records of the Medical History of the War.

For the Surgeon-general:

[Signed] C. R. DARNALL,
Col. Med. Corps, U. S. Army,
Executive Officer.

March 20, 1919.

[Refer to S. G. O. 700-7—Authority to Publish.]

Promotions.

Army Dental Corps.

Appointments of following by commanding general, American Expeditionary Forces, France, confirmed:

Announced March 26th:

To be LIEUT.-COLS.: Majs. Joseph A. Boarts, Grove W. Dunham, John McD. Eveleth, Charles S. Jack, Rea P. McGee, Archibald I. Miller, Wm. H. Potter, Wilbert J. Scruton, John Voss, and Otis H. McDonald.

To be MAJORS: Capts. Lawrence E. Aldrich, Edwin C. Baker, Egbert E. Baker, Fred A. Beaty, Lloyd Y. Beers, Edgar T. Blocher, Frank W. Boville, Frederick J. Brockman, James A. Brown, Walter T. Clark, Henry S. Davis, Wm. W. Irving, Laverne H. Jacob, James B. Jones, Ormsby Keselring, Edward F. Lafitte, Arthur Lankford, Wm. B. Ley, Robert R. Luce, Charles A. Mallon, Everett E. MacGibbon, Frank B. McAdams, Daniel F. McCarthy, Wm. McDougall, Earl N. McCue, Robert H. Nones, Jr., Wm. B. Noble, John S. Owens, Perry H. Plummer, Matthew F. Carney, Royal E. Wight, Alphonso F. Wilbur, John B. Williams, Robert L. Donaldson, Benjamin J. Durham, Bion R. East, Albert W. Farley, Charles W. Freeman, Otto F. Freitag, George N. Frost, Walter D. Gochenour, James B. Harrington, Arthur A. Hoffman, Carl M. Holland, Guy R. Harrison.

Carl A. Anderson, Thomas L. Rice, Arthur C. Roblin, Francis J. Rogers, James W. Ross, Bertram S. Rathwell, Frederick H. Saunders, Stanton L. Sherman, Edwin Shoemaker, David S. Smith, Harry R. Smith, Ivan E. Smith, Wm. S. Sykes, Harry A. Tuckey, Thomas H. Tye, John C. Vander Voort, Clarke B. Weeks, Floyd E. West, Raymond H. Williams, and Adolphus E. Worsham.

To be CAPTAINS: 1st Lieuts. Albert M. Aronberg, Jacob Asch, Austin C. Bamford, Emory C. Bardwell, James E. Ryan, Chester L. Sandiford, George E. Sandoz, John E. Schmidt, Arthur V. Seifert, Leo Shonfield, Wm. M. Slowe, John J. Small, Victor B. Souby, George E. Staats, Frank C. Starr, Robert W. Starr, Jr., Elmer Steiner, Leo Stern, Chelsa L. Storms, Beaman Story, Sylvester H. Straessley, James N. Sturdivant, Horace E. Metzner, Edwin Miller, Edgar J. Moore, Walter McN. Morgan, John D. D. Morrison, Robert E. Motley, Wm. W. Moyer, Raymond F. Muleahy, Reginald S. Murdock, Robert H. Murphy, Wm. G. Neale, Frank B. Netherland, Daniel B. Newton, Gerald B. O'Neil, Edwin J. Orton, Harrison L. Parker, Francis C. Bartleman, Wm. A. Barton, Lonzo G. Bean, Bernard L. Riley, Edgar C. Berryman, Beverly M. Epes, Charles H. Cole, James J. Mansfield, Howard E. Swartz, Francis H. Sylva, Campbell G. Tipton, Charl J. Torrence, Norman W. Trimpi, Henry P. Wadsworth, Perry H. Walet, Roy P. Walton, Forrest W. Ward, Cecil D. Washburn, Marvin V. Welcher, Richmond Wells, Roy E. Wheeler, Warren S. Whittle, Ralph H. Wickens, Marcus F. J. Wielage, Arnold E. Zurawski, Hope H. Payne, Henry C. Petray, George W. Phelan, Charles F. Pickering, Charles E. Porter, Rollo I. Pusey, Joseph L. Rahm, Samuel L. Rambo, Clarence H. Rangeley, James H. Ross, Jr., Jerome A. Rapp, Edwin J. Reichel, Louis E. Reif, Buford A. Rice, George A. W. Rigg, Arthur C. Rohde, Thomas C. Joseph, Starling E. Kay, John S. Kellogg, Edmund J. Kelly, Claude M. Kemper, Melvin H. King, Leroy E. Knight, Ralph M. Knight, Clarence F. Kohlmeier, Harold R. Lamb, George Le R. Lansdale, Austin L. Lawrence, Louis Lesser, Clifford E. Lewis, Harvey N. Lewis, Harold T. Lucas, Wm. R. Lutz, Charles F. MacDonald, Jr., Charles W. Hlavac, Thomas A. Holton, Percy Horridge, Harry L. Hosmer, George L. Felcher, Leroy M. Fink, Frederick L. Finnegan, Milburn M. Fowler, Stephen F. French, Norman E. Gardner, Clark R. Giles, Ralph E. Gill, Carolus R. Given, Malcolm Goddard, Wm. E. Graf, Ed Granger, Charles J. Gray, Leslie C. Bell, Kenneth B. Belinger, Howard F. Berkey, Cline S. Beurman, Owen I. Bird, George C. Booth, Harry F. Bohle.

Harry E. Bouden, Harry N. Boyne, Edward S. Bracken, Frederick DeS. Brent, Bissel B. Palmer, Jr., Henry A. Delaney, Alan Mac-lachlan, Arthur B. McCormick, Walter H. McCreary, John H. MacDermott, Wm. H. McLean, Matthew E. McKenna, Richard W. McLean, George C. McMullen, Thomas W. Magner, Agustin L. Magruder, Charles H. Manning, Herve C. Manon, Albert P. Matthews, John R. Maxom, John R. Merrill, Jr., Harry C. Metz, Archie R. Houns, Marion C. Izler, Cyrus C. Jones, Edward C. Jones, Charles S. Greaser, John P. Hacha, Robert W. Hammons, Gordon W. Hannah, Henry L. Harris, Thomas J. Hartigan, Charles P. Hatrick, Cecil R. Hays, Wm. J. Heffern, Otto B. Hinz, Kenneth Hillyer, Harry W. Hennis, Elmer J. Henn, Arthur E. Brown, Charles H. Brown, John D. Brown, Jr., Merritt E. Brown, Alexander C. Browne, John B. Bruns, Arthur G. Buehler, Harold H. Buehler, Richard H. Burkhardt, Milo Bushong, Lucius A. Butler, George L. Cassel, Charles L. Cassell, Stanley W. Clark, William J. Clegg, George A. Coleman, Joseph A. Colman, George W. Cook, Faber W. Croll, William G. Crosby, Harold W. Crowell, James A. Cunha, Homer C. Darrah, Evan W. Davies, Charles D. Dawkins, Burrell B. DeHaven, Charles G. Dentry, Jr., Herbert Dewar, George W. Dierks, Roger L. Dill, Frank D. Donlevy, Lew W. Dougherty, Willard L. Ellsworth, Hubert H. Elslager, Junius F. Emerson, Lee M. English, LeRoy M. Ennis, Arentz J. Ericson, Stanley G. Ewen, Arthur W. Ewin, Orville N. Fansler.

Assignments.

Army Dental Corps.

The twenty-two candidates for appointment to commissions in the Army Dental Corps who were examined last January have not been commissioned, the delay being due to the policy of the War department and instructions of the chief of staff of the army that no appointments should be made. If these vacancies were filled, there would remain thirty-nine places to be filled. It is probable that nothing will be done in that direction until it is known what will come of the departmental project for army increase and reorganization.—*Army and Navy Register*.

Week ending April 26th.

Maj. Frank B. McAdams, to Pittsburgh, Pa., general hospital 24, for duty.

Capt. Arthur B. McCormick, to Hoboken, N. J., port of embarkation, for duty.

Capt. Herman J. Brackman, to general hospital 36, Detroit, Mich.

Week ending May 3d.

Maj. Bion R. East, to Walter Reed General Hospital, D. C., for duty.

Maj. Arnett P. Matthews, to Camp Lewis, Wash., for duty.

Capt. Arthur C. Buehler, to Aberdeen, Md., proving ground, for duty.

Capt. Henry P. Wadsworth, to Southern department, for duty.

Capt. Harold H. Buehler, to Curtis Bay, Md., ordnance depot, for duty.

Week ending May 10th.

Capt. Harold H. Buehler, to Camp Pike, Ark., for duty.

Navy Dental Corps.

April 16th to 21st.

Lieut. Victor Armstrong, U. S. S. Hannibal to U. S. S. Arethusa.

Lieut. S. M. Akerstrom, N. P. O., Liverpool, to receiving ship at Liverpool.

Lieut. R. A. Ferguson, training barracks, Queenstown, to report to Admiral Halstead.

Lieut. (Jn.Gr.) J. E. Kerlihy, aviation, Queenstown, to report to Admiral Halstead.

Lieut. (Jn.Gr.) Martin Dray, naval training station, Newport, R. I., detached from duty naval training station, Newport, R. I.; to duty navy yard, New York, N. Y.

Lieut. R. B. Davis, detached from receiving ship at Philadelphia, to U. S. S. Michigan.

Lieut. J. A. Tartre, detached from receiving ship at Norfolk, to U. S. S. Pittsburgh.

Lieut. C. R. Wells, detached from naval training station, Great Lakes; to naval training station, naval operating base, Hampton Roads, Va.

Lieut. (Jn.Gr.) Walter Rehrauer, detached from naval training station, Great Lakes; to U. S. S. Hancock.

Lieut. (Jn.Gr.) J. J. Haas, to naval training station, naval operating base, Hampton Roads, Va.

Lieut. (Jn.Gr.) E. A. Jasper, to duty at naval training station, Newport, R. I.

April 22d.

Lieut. S. M. Akerstrom, receiving ship, Liverpool, report to Admiral Halstead for assignment.

Lieut. (Jn.Gr.) S. H. Beerman, detached from receiving ship at New York; to duty aboard Patricia.

Lieut. (Jn.Gr.) A. L. Keltie, detached from duty at the naval training camp, Pelham Bay Park, N. Y.; to duty at the naval air station, Rockaway Beach, L. I., N. Y.

Lieut.-com'r M. E. Harrison, base hospital No. 1, to base hospital No. 5.

Lieut. (Jn.Gr.) W. F. Kramer, detached from duty at naval training station, Great Lakes, Ill.; to duty at the naval training camp, Detroit, Mich.

Lieut.-com'r A. F. McCreary, detached from duty at naval training station, Great Lakes; to Marine Expeditionary Forces, Santo Domingo.

Lieut. (Jn.Gr.) T. P. Stack, detached from duty on the Ohio; to duty aboard New Jersey.

Lieut. (Jn.Gr.) F. C. Cuning, detached from duty at naval experiment station, New London, Conn.; to duty aboard the Fulton.

Lieut. (Jn.Gr.) F. V. Davis, detached from duty with the 8th regiment of marines, navy yard, Philadelphia, Pa.; to duty aboard Minnesota.

Lieut. (Jn.Gr.) H. L. Kalen, detached from naval training station, Great Lakes; to U. S. S. Montana.

Week ending April 30th.

Lieut. (Jn.Gr.) B. F. Sweeney, detached from duty at the navy yard, New York; to duty at section base, Cape May, N. J.

Lieut. G. M. Frazier, detached from U. S. S. Chicago; to U. S. S. Pittsburgh.

Lieut. (Jn.Gr.) J. E. Herlihy, base hospital No. 5, to report to senior naval officer in Turkey.

Lieut. J. A. Tarte, detached from U. S. S. Pittsburgh; to U. S. S. Chicago.

Lieut. (Jn.Gr.) F. C. Dunning, revocation of orders of April 26th; to duty on Fulton.

Lieut. James I. Root, detached from U. S. S. Arkansas; to Naval Academy.

Lieut. (Jn.Gr.) DeWitt C. Emerson, detached from receiving ship, New York; to duty abroad.

Lieut. (Jn.Gr.) Earl H. Zimmer, detached from naval training station, Great Lakes; to duty abroad.

Lieut. (Jn.Gr.) Percy B. Maskrey, detached from Naval Academy; to duty abroad.

October Meeting.

*** * * National Dental Association. * * ***

IGNORANCE has been and is the deadliest enemy of civilization.

It has cost more lives, wrecked more homes, and shattered more happiness than all the wars conducted by all the tyrants since the beginning of time.

Only in modern times have men been able to develop a real defense against the terrific toll of human life. So far this defense has only been built in small part. It will remain for the professional men of this and other countries to go on with the fight.

How many people in your community know the real value of the conservation of teeth or the effect of their decay on health?

Dentists must broaden the scope of dental education of the public which the war started.

The next meeting of the NATIONAL DENTAL ASSOCIATION will be held in New Orleans, La., October 20, 21, 22, 23, and 24, 1919.

C. V. VIGNES, *President*,

J. P. WAHL, *Chairman Local Committee*.

SOCIETY NOTES AND ANNOUNCEMENTS

NOTICES should reach the Office of the DENTAL COSMOS *not later* than the 11th or 12th of the month preceding that of publication.

Coming Dental Society Meetings.

With the National.

NATIONAL DENTAL ASSOCIATION. New Orleans. October 20th to 24th. [See p. 515.]

NATIONAL ASSOCIATION OF DENTAL EXAMINERS. New Orleans. October 20th to 24th.

NATIONAL ASSOCIATION OF DENTAL FACULTIES. New Orleans. October 20th to 24th.

ASSOCIATION OF MILITARY SURGEONS. New Orleans. October 20th to 24th.

DELTA SIGMA DELTA FRATERNITY. New Orleans. October 20th.

PSI OMEGA FRATERNITY, GRAND CHAPTER AND NATIONAL ALUMNI CHAPTER. New Orleans. October 20th to 24th.

XI PSI PHI FRATERNITY. New Orleans. October 20th to 24th.

State Meetings.

JUNE.

AMERICAN MEDICAL ASSOCIATION, SECTION ON STOMATOLOGY. Atlantic City, N. J. June 9th to 13th.

CALIFORNIA STATE DENTAL ASSOCIATION. San Francisco. June 23d to 28th.

DENTAL SOCIETY OF THE STATE OF NEW YORK. Syracuse. June 12th to 14th.

FLORIDA STATE DENTAL SOCIETY. Tampa. June 18th to 20th.

GEORGIA STATE DENTAL SOCIETY. Savannah. June 11th to 13th.

KENTUCKY STATE DENTAL ASSOCIATION. Louisville. June 9th to 12th.

NEW HAMPSHIRE STATE DENTAL SOCIETY. Manchester. June 18th to 20th.

NORTHERN OHIO DENTAL ASSOCIATION. Cleveland. June 2d to 4th.

NORTH CAROLINA DENTAL SOCIETY. Asheville. June 25th to 27th.

SOUTH CAROLINA DENTAL ASSOCIATION. Columbia. June 19th to 21st.

JULY.

NEW JERSEY STATE DENTAL SOCIETY. Atlantic City. July 16th to 18th.

PSI OMEGA FRATERNITY, OHIO ALUMNI CHAPTER. Cedar Point, Ohio. July 7th and 8th.

Examiners' Meetings.

ALABAMA BOARD OF EXAMINERS. Birmingham. June 16th.

ARIZONA BOARD OF EXAMINERS. Phoenix. July 10th.

ARKANSAS BOARD OF EXAMINERS. Little Rock. July 3d to 5th.

CALIFORNIA BOARD OF EXAMINERS. San Francisco, June 5th; Los Angeles, July 14th.

CONNECTICUT DENTAL COMMISSION. Hartford. June 19th to 21st.

DELAWARE BOARD OF EXAMINERS. Wilmington. July 16th and 17th.

DISTRICT OF COLUMBIA BOARD OF EXAMINERS. Washington, D. C. June 23d to 26th.

ILLINOIS BOARD OF EXAMINERS. Chicago. June 23d to 28th.

IOWA BOARD OF EXAMINERS. Iowa City. June 18th.

KANSAS BOARD OF EXAMINERS. Topeka. June 23d to 27th.

MAINE BOARD OF DENTAL EXAMINERS. Augusta. July 1st.

MARYLAND BOARD OF EXAMINERS. Baltimore. June 10th and 11th.

MASSACHUSETTS BOARD OF EXAMINERS. Boston. June 24th to July 1st.

MICHIGAN BOARD OF EXAMINERS. Ann Arbor. June 16th to 23d.

MISSISSIPPI BOARD OF EXAMINERS. Jackson. June 17th.

MISSOURI BOARD OF EXAMINERS. Jefferson City. June 9th to 11th.

NEBRASKA BOARD OF EXAMINERS. Omaha: June 2d and 3d. Lincoln: June 4th to 6th.

NEW JERSEY BOARD OF REGISTRATION. Trenton. June 23d to 27th.

NORTH CAROLINA BOARD OF EXAMINERS.
Asheville. June 23d.

NORTH DAKOTA BOARD OF EXAMINERS.
Fargo. July 8th.

PENNSYLVANIA BOARD OF DENTAL EXAMINERS. Philadelphia and Pittsburgh. June 23d to 26th.

RHODE ISLAND BOARD OF REGISTRATION.
Providence. July 1st to 3d.

SOUTH CAROLINA BOARD OF EXAMINERS.
Bamberg. June 30th.

SOUTH DAKOTA BOARD OF EXAMINERS.
Sioux Falls. June 25th to 27th.

TENNESSEE BOARD OF EXAMINERS. Nashville. June 30th.

UTAH BOARD OF EXAMINERS. Salt Lake City. June 25th to 28th.

VERMONT BOARD OF EXAMINERS. Montpelier. June 30th and July 1st and 2d.

VIRGINIA BOARD OF EXAMINERS. Richmond. June 24th.

WYOMING BOARD OF EXAMINERS. Cheyenne. June 24th to 27th.

Psi Omega Fraternity.

OHIO ALUMNI CHAPTER.

A REUNION and convention of the Ohio Alumni Chapter of the Psi Omega Fraternity will be held at Cedar Point, Ohio, on July 7 and 8, 1919.

E. L. PETTIBONE,
Cleveland, Ohio.

To Dental Surgeons of the American Expeditionary Forces.

NAMES WANTED FOR ORGANIZATION.

PLEASE forward at once full name, rank, and organization, and your home address, for the purpose of organizing and meeting with our national and state meetings.

Major R. F. ROWDYBUSH,
Walter Reed Hospital, Washington, D. C.

Association of Military Dental Surgeons.

THE Association of Military Dental Surgeons of the United States will hold its annual meeting at New Orleans, October 20 to 24, 1919.

The officers of the association are—Capt. Edwin P. Tignor, president; Capt. George H. Casaday, vice-president; R. W. Waddell, D.D.S., secretary and treasurer, 347 Fifth ave., New York City.

Dental Society of the State of New York.

THE Dental Society of the State of New York will hold its fifty-first annual meeting June 12, 13, and 14, 1919, at the Hotel Onondaga, Syracuse, N. Y. All ethical dentists residents of New York and those residing in adjoining states are cordially invited to be present at the sessions of the society.

Dr. A. C. Bickelhaupt, City Bank Bldg., Syracuse, N. Y., is chairman of the Exhibits Committee.

A. P. BURKHART, *Sec'y*,
52 Genesee st., Auburn, N. Y.

South Carolina Dental Association.

THE annual meeting of the South Carolina State Dental Association will be held on the campus of South Carolina University, Columbia, S. C., June 19 to 21, 1919.

G. A. MILNER, *President*,
ERNEST C. DYE, *Sec'y*,
Greenville, S. C.

California State Dental Association.

THE 1919 session of the California State Dental Association will be held at the University of California, San Francisco, Calif., June 23, 24, 25, 26, 27, and 28, 1919. The meeting will be conducted on the postgraduate plan. Members of other associations are invited providing their 1919 dues are paid, and that they pay the special fee for the course in which they may be interested. For further information address

J. E. GURLEY, *Sec'y*,
350 Post st., San Francisco, Calif.

Northwestern University Dental School.

ANNUAL HOMECOMING CLINIC.

THE annual Homecoming Clinic of the Northwestern University Dental School will be held June 16 and 17, 1919. A splendid program has been arranged for each day, covering subjects of vital interest in the practice of modern dentistry.

For information please communicate with the secretary of the Alumni Association,

M. M. PRINTZ,
25 E. Washington st., Chicago, Ill.

American Medical Association.

Section on Stomatology.

FOLLOWING is the program of the Section on Stomatology of the American Medical Association, for the meeting to be held at Atlantic City, N. J., June 9 to 13, 1919:

First Session.

(1) Chairman's Address. Eugene S. Talbot, Chicago.

(2) "Macrocheila, with Report of Two Cases." (Illustrated with stereopticon slides.) F. B. Moorehead, Chicago.

(3) "Teaching the Principles of Maxillo-facial Surgery in a Civilian School." Charles R. Turner, Philadelphia.

(4) "Teaching the Principles of Maxillo-facial Surgery in a Military School." G. V. I. Brown, Lt.-col. M.C.

(5) "Experience of a Dental Surgeon in an Evacuation Hospital." Leo Winter, Lt. D.C. and Rae P. McGee, Maj. D.C.

(6) "Experience of a Dental Surgeon in a Base Hospital in the Advanced Area." Ivan Smith, Capt. D.C.

(7) "Experience of a Dental Surgeon in a Base Hospital in a Base Section." Stewart Ruggles, Maj. D.C.

Second Session.

(8) "Experience of an Area Consultant in the Zone of the Advance." George Schaeffer, Maj. M.C.

(9) "Experience of an Area Consultant in a Base Section." Justin Waugh, Maj. M.C.

(10) "Experience of an Area Consultant in the Intermediate Section." Herbert A. Potts, Maj. M.C.

(11) "Observations on the Work at Queens Hospital in England." George Dorrance, Maj. M.C.

(12) "Reconstruction Work in War Injuries of the Jaws." (Lantern slides of cases.) Robert Ivy, Maj. M.C., and Joseph D. Eby, Maj. M.C.

Third Session.

(13) "Bone-grafting in Jaw Cases." Frank J. Tainter, Maj. M.C.

(14) Infected Fractures of the Mandible." McCauley, Lt. D.C. and Dameron, Lt. D.C.

(15) "Osteo-periosteal Bone-grafts of the Mandible as Performed by the French: A Report of Two Recent Cases." Henry S. Dunning, New York.

(16) "Prosthetic Appliances in Relation to the Surgical Treatment of Wounds of the Face and Jaws." V. H. Kazanjian, Maj. M.C.

(17) "Jaw Service at the American Red Cross Hospital No. 1, Paris." William Coughlin, Maj. M.C.

General discussion of Oral Surgery Service in the War will be opened by Vilray P. Blair, Lt.-col. M.C.

All dentists interested in this program are cordially invited to attend and take part in the discussions.

EUGENE S. TALBOT,

Chairman.

ARTHUR D. BLACK, *Sec'y.*

Kentucky State Dental Association.

JUBILEE MEETING.

THE fiftieth anniversary—"Jubilee meeting"—of the Kentucky State Dental Association will be held in Louisville, Ky., June 9, 10, 11, and 12, 1919.

A postgraduate course of unusual interest has been planned. Address all correspondence to

W. M. RANDALL, *Sec'y,*
Louisville, Ky.

North Carolina Dental Society.

THE North Carolina Dental Society will hold its next annual session June 25, 26, and 27, 1919, at Asheville, N. C. Headquarters Battery Park Hotel.

W. T. MARTIN, *Sec'y,*
Benson, S. C.

Dental Alumni Society of the University of Pennsylvania.

THE annual meeting of the Dental Alumni Society of the University of Pennsylvania will be held on Friday, June 13, 1919.

The business meeting of the society will be held in the lecture room of Evans Institute, Fortieth and Spruce sts., at 10 A.M. An interesting series of clinics will be given in the clinic hall, at 2 P.M. The annual dinner of the society will be held at the Hotel Adelphia, at 6.30 P.M. There will be reunions of classes '99, '09, '14, and others.

For further information address

Z. T. JACKAWAY, *Sec'y and Treasurer,*
1506 E. Susquehanna ave., Philadelphia, Pa.

Northern Ohio Dental Association.

THE Northern Ohio Dental Association meeting will be held in Cleveland, Ohio, Monday, Tuesday, and Wednesday, June 2, 3, and 4, 1919, at the Hotel Statler.

In connection with the meeting a post-graduate course will be held from the 2d to the 6th, inclusive, consisting of the following: "Nerve-blocking Anesthesia." Dr. Arthur E. Smith of Chicago. "Attachments to Vital Teeth." Dr. Edward T. Tinker of Minneapolis. "Prosthesis." Dr. M. M. House of Indianapolis.

GEO. B. SMITH, *Sec'y*,
Fremont, Ohio.

New Jersey State Dental Society.

THE forty-ninth annual convention of the New Jersey State Dental Society will be held on July 16, 17, and 18, 1919, on Young's Million Dollar Pier, Atlantic City, N. J.

The entire convention will be held on the pier. Machinery Hall will be used for the exhibits. Those who attended last year will remember the magnificent display of dental goods, and Dr. W. W. Hodges of Perth Amboy, N. J., chairman of the Exhibit Committee, with 25,000 square feet of space, has promised an exhibit greater than that of 1918. Dr. Angelo Zabriskie of Ridgewood, N. J., as chairman of the Clinic Committee, has arranged for a program of clinics that will prove of great interest.

The Essay Committee under the direction of Dr. Edward L. Wharton of Newark will present essayists of prominence—names and subjects to be announced.

All meetings for the presentation of papers as well as the business meetings will be held in the Greek Temple, out on the pier.

The headquarters of the society will be at the pier entrance. Mail may be directed to exhibitors, clinicians, or members, in care of the Secretary New Jersey State Dental Society, Young's Million Dollar Pier.

A list of hotels where special rates may be secured will be published in the *New Jersey Dental Journal* prior to the convention, or may be secured by addressing the secretary.

A cordial invitation is extended to ethical practitioners.

JOHN C. FORSYTH, *Sec'y*,
430 E. State st., Trenton, N. J.

Susquehanna Dental Association of Pennsylvania.

THE fifty-fifth annual meeting of the Susquehanna Dental Association will be held at Hotel Casey, Scranton, Pa., October 8, 9, and 10, 1919.

As the members of the association all remember, this meeting was to have been held at the same time and place last fall, but on account of the influenza epidemic it had to be canceled, and it was arranged to be held in October so as not to interfere in any way with the attendance at the April meeting of the State Dental Society at Pittsburgh.

The executive committee are working out plans to make this the best meeting in the history of the association. It is going to be one of those good old-fashioned meetings that no one can afford to miss.

Further details will follow, but we give you this friendly little tip now—that it is going to be somewhat along the postgraduate line, some of the biggest men in the profession having already been retained for the three days.

Watch for further details and begin to plan to lock up your office for the whole session. We will make it well worth the trip.

J. P. COULT,
E. L. BROWN,
J. B. TWEEDLE,

Committee.

Tennessee State Dental Association.

THE fifty-second annual meeting of the Tennessee State Dental Association will be held at the Hotel Hermitage, Nashville, September 4, 5, and 6, 1919.

From all appearances our program promises the greatest meeting ever.

JAS. J. VAUGHN, *Ch. Publicity Com.*
Nashville, Tenn.

Vermont State Dental Society.

At the annual meeting of the Vermont State Dental Society, held at Burlington, Vt., March 19 to 21, 1919, the following officers were elected: P. M. Williams, president; A. L. Pettee, first vice-president; G. M. Somers, second vice-president; P. E. Mellen, secretary; Thomas Mound, treasurer. Executive Committee—O. S. Nims, Fred F. Braley, and C. H. Cole.

P. E. MELLEN, *Sec'y*.

Society of Dental Science, N. S. W.

NEW DENTAL ORGANIZATION.

A NEW dental society, registered under the name of the Society of Dental Science, meets in the B. M. A. Buildings, Elizabeth st., Sydney, Australia.

Members of the Odontological Society of New South Wales, the New South Wales Dental Graduates Society, and the University of Sydney Dental Graduates Association, have joined forces, and will meet together in the interests of dental science.

STEWART ZIELE, *Hon. Sec'y.*

District of Columbia Board of Examiners.

THE Board of Dental Examiners of the District of Columbia will hold their regular examination on June 23 to 26, 1919. For application blanks and schedule of examinations address

C. A. HAWLEY, *Sec'y.*

1624 "I" st., N. W., Washington, D. C.

North Carolina Board of Examiners.

THE next meeting of the North Carolina State Board of Dental Examiners will be held at Asheville, N. C., beginning promptly at 9 o'clock on Monday morning, June 23, 1919.

For further information and application blank address

F. L. HUNT, *Sec'y.*
Asheville, N. C.

Alabama Board of Examiners.

THE Board of Dental Examiners of Alabama will hold an examination for certificates in the Birmingham Dental College, June 16, 1919. Application blanks must be filled and in the hands of the secretary not later than June 2d. For full information write

A. K. PARKS, *Sec'y-Treasurer.*
412-14 First Natl. Bank Bldg.,
Montgomery, Ala.

Maryland Board of Examiners.

THE Maryland Board of Dental Examiners will meet for examination of candidates for certificates on June 10 and 11, 1919, in Baltimore, at the dental department of the University of Maryland, at 9 A.M.

For application blanks and further information apply to

F. F. DREW, *Sec'y.*
701 N. Howard st., Baltimore, Md.

Nebraska Board of Secretaries.

THE Nebraska Board of Dental Secretaries will hold its examination as follows: The practical work at the Creighton Dental College, Omaha, June 2d and 3d; and the theoretical work at the Capitol building, Lincoln, June 4, 5, and 6, 1919. A special examination is being arranged for about one month later.

S. A. ALLEN, *Sec'y.*
Loup City, Nebr.

Iowa Board of Examiners.

THE next meeting of the Iowa Board of Dental Examiners for the examination of candidates for licenses will be held in Iowa City, at the College of Dentistry, commencing Wednesday, June 18, 1919, at 9 A.M.

For application blank and information address

J. A. WEST, *Sec'y.*
805 Pleasant st., Des Moines, Iowa.

Massachusetts Board of Examiners.

A MEETING of the Massachusetts Board of Dental Examiners for the examination of candidates for registration will be held in Boston, Mass., June 24 to July 1, 1919, inclusive. All applications must be filed complete with the secretary ten days before the date of the examination.

For further information address

GEORGE H. PAYNE, *Sec'y.*
29 Commonwealth ave., Boston, Mass.

California Board of Examiners.

THE next meeting of the Board of Dental Examiners of California for the purpose of examining applicants for a license to practice dentistry in that state will be held in the city of San Francisco beginning on the 5th day of June 1919, at 9.30 A.M. This examination will be followed by an examination to be held in the city of Los Angeles, beginning on the 14th day of July 1919, at 9.30 A.M. Each applicant shall file with the secretary of the board at least ten days before the date selected for each examination, the following credentials: (1) Diploma or certificate of graduation from a reputable dental college approved by the board. (2) A diploma from an accredited high school or a certificate signed by a state superintendent of public instruction (or similar officer) to the effect

that the applicant has had scholastic preparation equivalent in all respects to that demanded for graduation from a high school giving a four-year course of instruction. An applicant who has been a licensed practitioner of dentistry of some other state of the United States for a period of at least five years shall file such license or licenses, which will be accepted in lieu of high-school credentials. (3) Testimonial of good moral character. (4) A recent unmounted photograph of the applicant.

For further information, address

C. A. HERRICK, *Sec'y*,
133 Geary st., San Francisco, Cal.

Michigan Board of Examiners.

THE next meeting of the Michigan State Board of Dental Examiners will be held at the Dental College, Ann Arbor, Mich., June 16 to 23, 1919.

Applications for examination must be in the hands of the secretary ten days before the meeting.

For information address

B. S. SUTHERLAND, *Sec'y-Treasurer*,
Owosso, Mich.

Connecticut Dental Commission.

THE Connecticut Dental Commission will meet at Hartford, June 19, 20, and 21, 1919, to examine applicants for license to practice dentistry, to examine applicants for dental hygienist's license, and to transact any other business proper to come before said Commission.

For further information, address

EDWARD EBERLE, *Recorder*,
902 Main st., Hartford, Conn.

Kansas Board of Examiners.

THE next meeting of the Kansas Board of Dental Examiners for examination of candidates to practice dentistry in Kansas will be held at the National Hotel, Topeka, Kans., beginning June 23d at 7.30 p.m., and lasting through the 27th. The fee is \$25. For application blank and other information address the secretary.

J. FREMONT, *President*,
Kingman, Kans.

F. O. HETRICK, *Sec'y*,
Ottawa, Kans.

Virginia Board of Examiners.

THE next meeting of the Virginia State Board of Dental Examiners will be held in Richmond, Va., beginning at 9 o'clock on Tuesday morning, June 24, 1919.

For further information and application blanks address

J. LEWIS WALKER, *Sec'y*,
505 Taylor Bldg., Norfolk, Va.

South Carolina Board of Examiners.

THE next meeting of the South Carolina State Board of Dental Examiners will be held at Bamberg, S. C., commencing promptly at 9 o'clock, Monday morning, June 30, 1919. All applications should be in the hands of the secretary by June 20th.

Application blanks and further information may be obtained by addressing

R. L. SPENCER, *Sec'y*,
Bennettsville, S. C.

Mississippi Board of Examiners.

THE next meeting of the Mississippi State Board of Dental Examiners will be held in the Capitol Building, Jackson, Miss., on the third Tuesday in June. Examinations begin at 8.30 A.M. daily until completion. Fee \$10. Diploma from recognized school and certificate of moral character required. Application blanks and further information can be obtained from

B. J. MARSHALL, *Sec'y*,
6-7 Turner-Cox Bldg., Marks, Miss.

Missouri Board of Examiners.

THE Missouri Dental Board will hold their regular examination for examining applicants to practice dentistry in Missouri at Jefferson City, on Monday, Tuesday and Wednesday, June 9, 10, and 11, 1919, beginning at 8 A.M. on Monday.

The practical examination will be given at the St. Louis College on Friday and Saturday, June 6th and 7th.

It is much more convenient for the applicants to take the practical examination at the colleges. The practical examination will also be given at Jefferson City.

V. R. McCUE, *Sec'y*,
Cameron, Mo.

Illinois Board of Registration.

THE next meeting of the Committee of Dental Examiners for the examination of applicants for licenses to practice dentistry in Illinois will be held in Chicago, the week commencing Monday, June 23d. For application and further information, address the Department of Registration and Education, Springfield, Ill.

E. C. DODDS, *Sup't of Registration.*

Pennsylvania Board of Examiners.

THE next examination by the Pennsylvania Board of Dental Examiners will be held in Philadelphia and Pittsburgh on Monday, Tuesday, Wednesday, and Thursday, June 23, 24, 25, and 26, 1919. The practical examination will be held on Monday, June 23d, the first day, in the University of Pittsburgh Dental School in Pittsburgh, and the Evans Institute, University of Pennsylvania, Philadelphia. The operative examination will be held at 8.30 A.M. and the prosthetic examination at 1.30 P.M. The theoretical examination will be held at the College of Pharmacy, in Pittsburgh, and at Musical Fund Hall, Philadelphia.

Application papers can be secured from the department of Public Instruction, Harrisburg. For further information address

ALEXANDER H. REYNOLDS, *Sec'y*,
4630 Chester ave., Philadelphia.

Wyoming Board of Examiners.

THE annual meeting of the Wyoming Board of Dental Examiners will be held at Cheyenne, Wyo., beginning on the last Tuesday of June, the 24th, continuing to the 27th, inclusive.

An examination is required of all applicants, and only holders of diplomas from reputable dental colleges are eligible to such examination. The board does not interchange with other states nor issue any temporary permits. No dentist can begin the practice of his profession in this state without first making application for an examination to the secretary of the board, and at the same time paying the examination fee of twenty-five dollars and submitting his diploma for inspection.

The written examination consists of anatomy, physiology, histology and bacteriology, chemistry and metallurgy, oral surgery, anesthesics, operative and prosthetic dentistry,

materia medica and therapeutics, prophylactics, and orthodontia. Applicants must present a full plaster model of upper and lower with teeth, also one without teeth. Practical work will be required from all candidates taking the examination. The candidate is required to furnish his own operation instruments, dental engine, amalgam, gold, wax, and modeling compound.

For further information and application blanks, address

PETER APPEL, JR., *Sec'y*,
P. O. Box 643, Cheyenne, Wyo.

South Dakota Board of Examiners.

THE next meeting of the South Dakota State Board of Dental Examiners will be held in Sioux Falls, S. D., June 25, 26, and 27, 1919, beginning promptly at 9 A.M. June 25th.

All applications must be in the hands of the secretary by June 20th. Fee for examination \$25.00. No reciprocity or interchange. Address

L. S. SPENCER, *Sec'y*,
Watertown, S. D.

Tennessee Board of Examiners.

THE next meeting of the Tennessee State Board of Dental Examiners will be held in Nashville, Tenn., June 30, 1919, for the examination of candidates for registration.

All applications must be in the hands of the secretary on or before the 20th of June. For further information address

F. W. MEACHAM, *Sec'y*,
911-12 Hamilton Natl. Bank Bldg.,
Chattanooga, Tenn.

Vermont Board of Examiners.

THE next meeting of the Vermont Board of Dental Examiners, for the examination of candidates to practice in Vermont, will be held at the State-house, Montpelier, commencing at 2 P.M. on June 30, 1919, and continuing for three days.

To be eligible for examination a candidate must be (1) twenty-one years of age, (2) a graduate of a high school of the first class, and (3) a graduate of a reputable dental college.

Applications must be in the hands of the secretary not later than June 21st.

For further information apply to

HARRY F. HAMILTON, *Sec'y*,
Newport, Vt.

Utah Board of Examiners.

THE next meeting of the Utah Board of Dental Examiners will be held June 25, 26, 27, and 28, 1919, at Salt Lake City.

J. F. CHRISTIANSEN, *Sec'y*,
Salt Lake City, Utah.

New Jersey Board of Registration.

THE State Board of Registration and Examination in Dentistry of New Jersey will hold their regular examination in the State-house, Trenton, N. J., June 23d to 27th. License fee, \$25, re-examination fee, \$10. Practical tests required: Insertion of an approximal gold filling with approximating tooth in position, compound approximal amalgam filling, a silicate filling, practical test of applicant's ability in oral prophylaxis, and preparation of cavity for an inlay with wax pattern. Also the soldering of a bridge consisting of three or more teeth exclusive of abutments, and one Richmond crown, which may be one of the abutments of the bridge; these must be struck from dies made from an impression of the mouth, and the articulating model, with the bridge, when soldered, must be submitted for inspection. An anatomical articulation of a full upper and lower set of teeth will also be required; teeth to be furnished by applicant. Wax bite properly trimmed and in place on models for inspection before setting up teeth.

Attention is directed to the following quotation from the dental law of New Jersey:

"Applicant shall present to said board a certificate from the Commissioner of Education of this state, showing that before entering a dental college he or she had obtained an academic education consisting of a four-year course of study in an approved public or private high school, or the equivalent thereof." In accordance with this law the secretary will issue application blanks only upon presentation of the required certificate from the Commissioner of Education, State-house, Trenton, N. J.

Note: Dental Radiography will be added to the list of theoretical examinations in June 1919.

Applications must be filed complete ten days before the date of the examinations. Address all communications for further particulars to

JOHN C. FORSYTH, *Sec'y*,
430 E. State st., Trenton, N. J.

Delaware Board of Examiners.

THE Delaware Board of Dental Examiners will meet for the examination of candidates for certificates on July 16 and 17, 1919, in Wilmington, at the Municipal building at 9 A.M. Fee for examination \$25.

W. S. P. COMBS, *Sec'y*,
Middletown, Del.

Rhode Island Board of Registration.

THE regular semi-annual meeting of the Rhode Island Board of Registration in Dentistry for the examination of applicants will be held in the State-house, Providence, R. I., July 1, 2, and 3, 1919. All applications with proper fee must be filed one week previous. For further information address

ERNEST A. CHARBONNEL, *Sec'y*,
334 Westminster st., Providence, R. I.

Arkansas Board of Examiners.

THE Arkansas State Board of Dental Examiners will hold their examinations at Hotel Marion, Little Rock, Ark., July 3, 4, and 5, 1919. All applications must be in the hands of the secretary on or before June 23d. Examination fee \$15. For further information and application blanks address

H. J. GREEN, *Sec'y*,
Paragould, Ark.

Maine Board of Examiners.

THE Maine Board of Dental Examiners will meet at the State-house, Augusta, for its next regular examination, beginning July 1, at 8.30 A.M.

All applications and fee of \$20 must be in the hands of the secretary by June 21st.

The examination of dental hygienists will be given at the same time; fee \$10.

WILL S. PAYSON, *Sec'y*,
Castine, Me.

Arizona Board of Examiners.

THERE will be a meeting of the Arizona Board of Dental Examiners at Phoenix, Ariz., beginning July 10, 1919, to examine candidates for a license to practice dentistry in Arizona, and to transact such other business as may properly come before the board.

Application blanks may be secured from the secretary of state, Phoenix, Ariz.

W. P. SIMS, *Sec'y*,
Box 58, Bisbee, Ariz.

New York State Examinations in Dentistry.

POSTPONEMENT BY THE BOARD OF REGENTS.

BECAUSE of the interference with the course of instruction, caused by the emergent inauguration of the Students Army Training-corps in connection with dental schools, it has been found that in many cases it is necessary to extend the course of instruction in the schools, for the current senior year, to a period beyond the regular date of graduation, many of the schools being obliged to lengthen the course to July 15th and some to a date as late as July 31st.

To the end that there may be no hardship to students thus graduating after the date of our regular June dental examination, it has been formally decided by the Board of Regents to postpone the June dental examination until the first Tuesday of September, and the September examination until the second Tuesday of November.

There will therefore be no June dental examination held in this state in 1919, but this will not affect examinations in subsequent years.

AUGUSTUS S. DOWNING,
Assistant Commissioner of Education.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING MARCH 1919.

March 4.

- No. 1,296,009, to JOSEPH I. RICHARDS. Artificial tooth attachment and method of making and utilizing the same.
- No. 1,296,067, to ALFRED C. FULLER. Toothbrush.
- No. 1,296,186, to WILLIAM J. HINES. Toothbrush.
- No. 1,296,231, to ALBERT G. TILLMAN. Fastener for toothbrush holders.
- No. 1,296,429, to HUGH W. REYNOLDS. Artificial tooth.
- No. 1,296,473, to HENRY J. BRASHIER. Receptacle for blacking, tooth-paste, and like plastic materials.

March 11.

- No. 1,296,643, to GILBERT D. FISH. Dental surveying apparatus.
- No. 1,296,846, to WILLIAM R. PHELPS. Artificial tooth.
- No. 1,296,928, to ARTHUR N. CROSS. Artificial tooth.
- No. 1,297,199, to JOSEPH A. MCAULEY. Attaching means for removable dentures.
- No. 1,297,233, to VINCENT PASTORE. Guard for brushes.

- No. 124,675, to CHEMISTS CO. OF NEW YORK. Trade-mark for antiseptic tooth-paste.

March 18.

- No. 1,297,352, to CLAUDE B. HOSTETLER. Dental tool.
- No. 1,297,448, to WALTER W. CRATE. Mold for making artificial teeth.
- No. 1,297,494, to MEYER L. RHEIN. Dentifrice.
- No. 1,297,561, to FRANK G. GUNTNER. Attaching means for dentures.
- No. 1,297,771, to CHARLES ABEL. Rotary toothbrush.
- No. 124,840, to GARHART DENTAL SPECIALTY Co. Trade-mark for materials adapted upon admixture to form a so-called porcelain filling for teeth.
- No. 124,916, to WILMOT CASTLE Co. Trade-mark for sterilizers adapted for laboratory and surgical work.

March 25.

- No. 1,298,041, to JAMES H. HARRIS. Toothbrush holder.
- No. 1,298,419, to CHARLES E. SUMMY. Artificial tooth.
- No. 124,945, to THE S. S. WHITE DENTAL MFG. Co. Trade-mark for dental chairs.

REPORT OF THE COMMITTEE

Appointed by the Lord President of the Council to Investigate the Extent and Gravity of the Evils connected with the Practice of Dentistry and Dental Surgery by Persons Not Qualified under the Dentists Act.

Presented to Parliament by Command of His Majesty.

[THE following Report presents the results of an investigation made by a Royal Commission appointed for the purpose into the conditions affecting dental service in Great Britain.

It deals with the shortage of registered dentists, the reasons for the increase of unregistered practitioners of dentistry, the causes of dental quackery, the extent and character of the resulting dental malpractice, the means suggested for the elimination of the existing evils, proposals for the promotion of dental education, and the extension of dental service to the public and school children, under Government direction, as a function of the general Health service.—ED. DENTAL COSMOS.]

CONTENTS.

Introductory.

Section I:

THE DENTISTS ACT, 1878.

Section II:

DENTAL PRACTICE IN GREAT BRITAIN AND IRELAND.

Section III:

PRACTICE OF DENTISTRY BY INCORPORATED COMPANIES.

Section IV:

THE EVILS ARISING FROM DENTAL PRACTICE BY UNREGISTERED PRACTITIONERS.

Section V:

DENTAL DISEASE IN RELATION TO THE HEALTH OF THE PEOPLE.

Section VI:

SHORTAGE OF REGISTERED DENTISTS.

Section VII:

CAUSES OF THE SHORTAGE OF REGISTERED DENTISTS AND SUGGESTED
REMEDIES.

Section VIII:

DENTAL TREATMENT ASSISTED BY THE LOCAL GOVERNMENT BOARD.

Section IX:

SCHOOL DENTAL INSPECTION AND TREATMENT.

Section X:

DENTAL TREATMENT UNDER THE NATIONAL INSURANCE ACT.

Section XI:

MISCELLANEOUS VOLUNTARY AIDS TO DENTAL TREATMENT.

Section XII:

A PUBLIC DENTAL SERVICE.

Section XIII:

THE EDUCATION AND TRAINING OF DENTAL PRACTITIONERS.

Section XIV:

CONTROL OF THE DENTAL PROFESSION.

Section XV:

ETHICAL STANDARD FOR DENTISTS.

Section XVI:

PROHIBITION OF DENTAL PRACTICE BY UNREGISTERED PERSONS.

Section XVII:

ADMISSION OF UNREGISTERED PRACTITIONERS TO THE DENTAL REGISTER.

Section XVIII:

FORM OF DENTISTS' REGISTER AND TITLE TO BE CONFERRED BY
REGISTRATION.

Section XIX:

LEGISLATION TO PREVENT DENTAL PRACTICE BY UNREGISTERED PERSONS.

Section XX:

DENTISTS' FEES.

Section XXI:

SCHOLARSHIPS FOR DENTAL STUDENTS.

Section XXII:

DENTAL RESEARCH.

Section XXIII:

AID TO DENTAL SCHOOLS.

Section XXIV:

EDUCATION OF THE PUBLIC IN THE NEED FOR DENTAL TREATMENT.

Section XXV:

MISCELLANEOUS.

Summary of Principal Recommendations, and Conclusion.

APPENDIX.

NAMES AND QUALIFICATIONS OF WITNESSES.

REPORT OF THE COMMITTEE.

To the Right Honourable EARL CURZON OF KEDLESTON, K.G., G.C.S.I., G.C.I.E.
(Lord President of the Council.)

MY LORD,

1. We have the honour to submit our Report and Recommendations under your Lordship's order of reference of the 12th day of July, 1917.

Our meetings have been held at the Board Room, Privy Council Office, Downing Street, for which we are indebted to Sir Almeric FitzRoy, K.C.B., K.C.V.O., one of our members.

The comforts and convenience of the Committee and witnesses have been greatly added to by having such a commodious and centrally situated meeting place.

2. The Committee have met on 27 days and have examined 27 witnesses. These have included witnesses nominated by the General Council of Medical Education and Registration of the United Kingdom, the Royal College of Surgeons of England, the British Dental Association, the Incorporated Dental Society, Ltd., the London and Counties Medical Protection Society, Ltd., the Medical and Dental Defence Union of Scotland, Ltd., the National Dental Corporation, Ltd., the Chemists Dental Society of Great Britain and Ireland, the School Dentists Society, and the Dental Society of Ireland. We have heard evidence from Medical Officers of Health, School Medical Officers, and the Managing Director of a Company practising dentistry. At the invitation of the Committee, Professor Sidney Webb, LL.B., and Mr. W. C. Anderson, M.P., attended and submitted their views to the Committee. We have not thought it necessary to ask for evidence from public departments, as the Committee includes officers or representatives from the principal public departments concerned.

3. We have been supplied with Memoranda and other documents by representative bodies and societies and by persons interested in our terms of reference. We desire to thank our numerous correspondents for many valuable suggestions. All communications have received individual and careful consideration and the principal ones are referred to and quoted from in the report. We wish it to be clearly understood, however, that any opinions expressed or statements quoted are to be regarded as those of the persons making them, and the Committee are not to be considered as endorsing them unless this is expressly stated.

4. The Committee have decided, with a view to economy in labour and paper, not to print the voluminous evidence heard by them or the numerous memoranda they have received. The notes of the evidence and other documents have been carefully filed and, if at a later date, under different circumstances, it should be considered necessary to publish them, such as are not confidential will be available for this purpose.

Section I.—The Dentists Act, 1878.

5. The Dentists Act was passed on 22nd July, 1878.

It provided, *inter alia*, for the formation of a register of persons who, as stated in the preamble to the Act, "were specially qualified to practise as dentists," prescribed the qualifications necessary for registration and reserved for the exclusive use of the registered practitioner certain titles descriptive of his profession. It entrusted the making and keeping of the Dentists' Register to the "General Council of Medical Education and Registration of the United Kingdom" which had been set up by the Medical Act of 1858. For the purpose of exercising the powers of

erasure from, or restoration to, the register, of any entry, the General Council were to ascertain the facts of the case by means of a Statutory Dental Committee of the Council not exceeding 5 in number. Provision was also made for the holding of examinations by competent authorities for the purpose of testing the fitness of persons to practise dentistry or dental surgery, and for the conferring of the diploma of licentiate in dental surgery or dentistry by the examining body. The diploma constitutes the qualification for registration. The General Medical Council were entrusted with a general oversight of the examination and were enabled to make a representation to the Privy Council if, in the opinion of the General Council, the course of study and examination of any particular college was insufficient to secure the requisite knowledge and skill for the efficient practice of dentistry or dental surgery. The Privy Council on receipt of such a representation were enabled to make an order that a certificate granted by the particular college shall not confer any right to registration under the Act.

The privileges of registered persons were set out in Section 5 of the Act as the right to practise dentistry and dental surgery in any part of His Majesty's dominions (subsequently modified by Section 26 of the Medical Act, 1886, as "subject to any local law in force in that part" and to be entitled to recover any fee or charge, in any court, for the performance of any dental operation or for any dental attendance or advice.

6. The preceding paragraph states briefly the principal provisions of the Dentists Act, 1878, so far as they affect the registered dentist. The Act also contains in Sections 3 and 5 important provisions dealing with the practice of dentistry by unregistered practitioners. These sections are in the following terms:

"3. Penalty on unregistered persons using title of 'dentist' etc.—From and after the 1st day of August, 1879, a person shall not be entitled to take or use the name or title of 'dentist' (either alone or in combination with any other word or words), or of 'dental practitioner,' or any name, title, addition, or description implying that he is registered under this Act or that he is a person specially qualified to practise dentistry, unless he is registered under this Act.

Any person, after the 1st day of August, 1879, not being registered under this Act takes or uses any such name, title, addition, or description as aforesaid, shall be liable, on summary conviction to a fine not exceeding twenty pounds; provided that nothing in this section shall apply to legally qualified medical practitioners."

"5. Privileges of registered persons.—A person shall not be entitled to recover any fee or charge, in any court, for the performance of any dental operation or for any dental attendance or advice, unless he is registered under this Act, or is a legally qualified medical practitioner."

7. Section 3 has been the subject of considerable legal controversy. Varying decisions were given in the English, Scottish and Irish Courts. It was not until the 15th April, 1910, that in the case of *Bellerby v. Heyworth*, an authoritative decision was obtained from the House of Lords confirming a decision of the Court of Appeal, which had reversed a decision obtained in England in the Chancery Division.

The effect of this decision is summarised by Harper in his *Legal Decisions upon the Medical and Dental Acts* as follows:

"The words 'specially qualified to practise dentistry' in section 3 of the Dentists Act, 1878, import a professional qualification entitling the holder to registration under the Act, and not merely professional skill or competence. There is nothing in the Act which prevents any man from doing dentists work and informing the public that he does such work without being registered under the Act."

This decision constitutes the Charter of the unregistered dental practitioner; in effect it seems to bring within the lawful occupation of any man the practice of dentistry provided he does not use the description of "dentist" or "dental practitioner" or any name, title, etc., implying that he is registered under the Dentists Act.

8. Section 5 has also been the subject of important legal decisions. These are briefly to the effect that the Section does not prevent an unregistered person recovering the cost of artificial teeth supplied. When payments have been made on account under a contract in respect of operative work and provision of artificial teeth, any payments that have been made may be appropriated towards payment of the operative work performed on the patient, and the patient may still be sued for payment for the mechanical work.

Section II.—Dental Practice in Great Britain and Ireland.

9. *The Registered Dentists.*—These consist of a body of practitioners whose names and qualifications are registered in accordance with Section 11 of the Dentists Act, 1878. The register is in the custody of the general registrar of the General Medical Council, which Council has the duty of causing a correct copy of the Register to be printed, published, and sold at least once a year. To qualify for registration it has been necessary for the applicant since 1879 either to be:

- (a) A licentiate in dental surgery or dentistry of any of the medical authorities having power to grant surgical degrees.
- (b) A person to be registered as a foreign or colonial dentist in accordance with Sections 8-10 of the Dentists Act, 1878.

In addition to those registered under (a) or (b) a number of practitioners were registered before the 1st August, 1879, under Section 6 of the Dentists Act, 1878. This section provided that any person who at the passing of the Act was "*bonâ fide* engaged in the practice of dentistry or dental surgery, either separately or in conjunction with the practice of medicine, surgery, or pharmacy, shall be entitled to be registered." An applicant for registration under Section 6 had to produce or transmit to the registrar a declaration signed by him in a form prescribed in a schedule to the Act. The form prescribed was as follows:

"I, _____, residing at _____
hereby declare that I was *bonâ fide* engaged in the practice of dentistry at _____,
at the date of the passing of the Dentists Act, 1878.

(Signed)

(Witness)

"Dated this _____ day of _____, 18 ____."

The registrar was given power, if he saw fit, to require an affirmation as to the truth of a declaration. Provision was also made in Section 37 for the registration, under certain conditions, of articled pupils, dental students and apprentices.

10. We understand that many persons were, under Sections 6 and 37, admitted to registration with very little inquiry, and Sir Donald Macalister, in giving evidence before us, stated:

"The Dentists Act which was passed in 1878 provided for the recognition of those who had been actually students or apprentices at the time, as well as those who had been in practice. The result was that a large number of very immature persons got the necessary papers and appeared either as nominal students or apprentices, and they still appear in the Register. Now and then we have a person brought before us who was registered in 1878 who, when we look at

him, must have been registered when he was 10 or 11 years of age, if his statements are correct."

11. The number of licentiates in dental surgery in 1878 was very few, and the first register compiled under the Dentists Act, 1878, was mainly composed of the names of persons who, on their own declaration, were stated to be engaged in the *bonâ fide* practice of dentistry at that date or who were admitted by virtue of being dental students or apprentices. The position at the present time is fundamentally different. Out of 5,524 persons whose names appear in the Dentists' Register for 1918, no fewer than 4,214, or 76 per cent. were Licentiates or Graduates in Dentistry. The names of 1,274 persons admitted by virtue of practice without any additional qualification in 1878 still remained on the register, but many of these have doubtless retired from the active work of their profession. Those still practising have had 40 years' experience, which in a measure compensates for the want of training and instruction which may have been lacking in their case at the time of their registration in 1879.

The dental profession at the present time consists of about 5,500 registered practitioners of whom at least 75 per cent. are either Licentiates or Graduates in Dental Surgery after approved courses of instruction and training tested by examinations.

The remaining 25 per cent. is a rapidly declining body of practitioners of long experience who were admitted to the profession in 1878. The number of Colonial and Foreign Dentists appearing in the Dentists' Register is practically negligible, being only 29 in 1918.

12. *The Medical Practitioner as Dentist.*—All legally qualified medical practitioners are entitled to practise dentistry and have the same legal rights to recover fees as a dentist registered under the Dentists Act of 1878. A legally qualified medical practitioner is exempted from any disability in the practice of dentistry that is imposed on persons, other than registered dentists, by the Dentists Act, 1878.

13. *Unregistered Dental Practitioners.*—In addition to dentists registered under the Dentists Act and medical practitioners there are in the United Kingdom a large number of persons practising dentistry, in some or all of its forms, devoting the whole or part of their time to dental work. The evidence submitted to us is to the effect that, until the outbreak of the war, the tendency was for unregistered dental practice to increase. Especially was this the case with unregistered dental company practice. A number of unregistered dental practitioners have formed associations to protect their interests and some of them regulate the conditions under which their members shall practise and the ethical standard that shall be observed. The most important of these associations is the Incorporated Dental Society, Limited, which had until recently a membership of about 1,600. This society expects its members to observe a certain professional standard, has provided clinics and arranged lectures for the benefit of its members, and, in recent years, has insisted on new members passing an examination test conducted by its own members. The number of unregistered dental practitioners who are members of some recognised dental society is about 2,000.

14. In addition to persons practising on their own account there are a large number of unregistered practitioners engaged in dental company work. The business of dental companies is mainly pursued by means of skilled advertising, sometimes of a misleading character, and by personal house to house canvassing. The sale of artificial teeth is the main part of company business, and so-called easy instalment systems of payment are frequently used to induce persons of limited means to consent to having teeth removed and artificial dentures substituted. The evils of some forms of dental company practice have been represented to us in the

strongest possible terms. The evidence in this respect comes from representatives of unregistered practitioners as well as from the registered dentist. In addition to company practice there are a large number of unregistered practitioners of indifferent general education who have set up as dental practitioners without any training or instruction whatsoever. By means of specious advertising and personal canvassing they ply their calling to the danger of the public, but with very lucrative results to themselves.

15. We find ourselves unable to frame an estimate of the total number of unregistered practitioners. Their names do not appear in local or trade directories under any particular headings. Their total number is certainly much greater than that of registered dental practitioners. Whatever may be the precise number of unregistered practitioners the evidence submitted to us is conclusive that it is the least reputable section of unregistered dental practice that has increased most, and tends to increase. This constitutes a menace alike to the public health, the registered dental profession and the more reputable unregistered practitioners.

Evidence submitted to us indicates that dental practice is carried on by unregistered persons of widely varying grades of social standing, education and training, ranging from the few fully trained and qualified practitioners who have refrained from registering, the graduate from a dental college or an University in the United States, and the old standing experienced unregistered practitioner, to the insurance or sewing machine canvasser, the butcher, and the blacksmith.

Section III.—Practice of Dentistry by Incorporated Companies.

16. We have in paragraph 14 briefly alluded to the practice of dentistry by companies. In this section we shall refer more fully to this subject. We have received a large amount of evidence of the evils resulting from company dental practice from, *inter alia*, the General Medical Council, the British Dental Association, the London and Counties Medical Protection Society, Ltd., and the Medical and Dental Defence Union of Scotland. The evils appear to have reached a climax in the practice of dentistry by a number of so-called "Hygienic Institutes," set up as separate Companies in the principal towns of Great Britain and Ireland from 1906 onwards. These hygienic institutes, we are informed, numbered at least 57 and sprang from a central company founded by an alien whose varied occupations had no connection with dentistry. The institutes flourished from 1906 to about 1912 and some may still exist. Grave injuries were inflicted on many patients, and when actions were taken against the company it was usually found that any damages awarded were irrecoverable owing to there being no assets, or such assets as existed being in possession of debenture holders. These institutes carried on a dental business by means of advertisement and house to house canvassing, they employed untrained and inexperienced men, and charged fees as high or higher than would have been charged by a registered dentist. These particular companies are referred to by each of the bodies tendering evidence as to the evils resulting from unqualified dental practice, and it is very evident that they constituted a serious menace to the public health. Emphasis has been laid on the fact that the facilities for unqualified practice and avoidance of financial liability for injury have in these instances been greatly aided by the operations being carried on by a limited company.

17. The British Dental Association has furnished us with a number of instances in which damages have been obtained for injuries inflicted by operators working in the capacity of servants of companies trading as hygienic institutes. It will suffice to quote four cases, one from each portion of the United Kingdom, submitted to us

by the association. They are typical of many others in the list, and indicate the widespread nature of the evil.

Case No. 1. "Glasgow Sheriff Court. £100 damages against the Glasgow Hygienic Institute for injury done by unskilful dental operation. Patient's jaw fractured in extraction of seventeen teeth and mouth very much lacerated, his general health being seriously and injuriously affected in consequence. Sheriff Fyfe in his judgment said the case was a striking illustration of the wide gulf which often exists between the letter and the spirit of a Statute (the Dentists Act). . . . This Hygienic Institute seemed to him about the most barefaced evasion of an Act of Parliament which ingenuity could suggest, for they go as near designating themselves Dentists as it was possible to go."—*Glasgow Herald*, Feb. 3, 1910.

Case No. 2. "Durham County Court. £56 damages with costs awarded Mrs. Knaggs against Bishop Auckland Hygienic Institute. The doctor's evidence stated that part of the jaw was literally torn away; the woman seemed to be suffering from cocaine poisoning and from slight lockjaw; bleeding continued for five or six days. 'He had never seen a mouth in such a condition in his life; it was torn to pieces. There was a compound fracture of the jaw.'"—*Durham Chronicle*, Jan. 21, 1910.

Case No. 3. "Waterford County Court. £20 damages and expenses awarded against Hygienic Institute for overdose of cocaine to J. O'Brien; evidence of cocaine poisoning necessitating medical attendance to save life."—*Waterford Evening News*, April 13th, 1910.

Case No. 4. "Cardiff County Court. Judgment for £8 and costs against Hygienic Institute, Cardiff, for illness of patient for fourteen days."—*South Wales Daily News*, May 6th, 1910.

The case of these "Hygienic Institutes" affords the most striking instance of the abuse of the Companies Act for the practice of dentistry by unqualified practitioners. Numerous other instances have also been submitted to us of evils arising from company dental practice.

18. In 1909 the Lord President of the Council requested the Local Government Board and the Local Government Boards for Scotland and Ireland to collect certain information from Medical Officers of Health on the practice of Medicine and Surgery by unqualified persons. The information collected was summarised by the several Local Government Boards and submitted in a report to Parliament by the Lord President of the Council.* In the summary for England and Wales it is stated that:

"Dental Companies, Hygienic and other Institutes do a large amount of dental surgery, largely through agents. They canvass from house to house, and charge fees as high as qualified dentists. Many unqualified dental firms make periodical tours of the towns, advertising the particulars of their visit in the local press beforehand, and hiring a consulting room, *e.g.*, at a hotel, for the occasion."

The summary was prepared from replies received from over 1,600 medical officers of health, many of whom had consulted the local division of the British Medical Association or the local medical society. The replies received therefrom represent not only the opinions of medical officers of health but also of many medical practitioners in general practice.

19. It has been represented to us by the British Dental Association that various causes induce an unqualified practitioner to work under the Companies Act. In

* Report as to the Practice of Medicine and Surgery by Unqualified Persons in the United Kingdom, 1910. (Cd. 5422.)

an action for damages there is often considerable difficulty in a plaintiff ascertaining who is liable, and when damages are awarded against a company it is sometimes found impracticable to recover the amount* of the judgment by reason of the paucity of the capital and assets. In other instances debentures have been created and the appointment of a receiver for the debenture holders has effectively prevented the judgment being made operative. Besides these inducements for unregistered practitioners to form limited companies it has been represented that persons unconnected with dentistry form companies and carry on the business by employing unqualified men, the proprietors taking no part in the business.

20. Running right through the evidence we have received from representatives of both the registered and unregistered practitioners is the contention that the relation between a patient and his dentist is a personal one similar to that prevailing between a patient and his doctor. The responsibility of the dentist to his patient, the maintenance of the professional status of the dentist and the observance of an ethical professional standard are claimed to be to the advantage of the public and necessary in the public interest. Where the dental operator is the servant of a company it is alleged that these factors hardly exist. These and other evils and disadvantages to the public described as resulting from company dental practice have been repeatedly represented to us.

21. We have on the other hand only had one opportunity of considering the claims advanced by a dental company that company dental practice is in the public interest, only one company having approached the Committee and expressed a desire to give evidence. This company is the Macdonald Manufacturing Co., Ltd., which has submitted two memoranda to the Committee, and whose managing director, Mr. J. H. Morris, was heard in evidence before the Committee. The company claimed that the time and expense involved in obtaining the full qualification for registration as a dentist is incompatible with the growing demand for economical dentistry for the wage earning sections of the public; also that, with its wide spread branch establishments, it has done much to meet this demand, and that if the doubt as to continued hostile legislation was finally removed and the company's rights firmly established by constructive legislation it would be able to continue with advantage to the community. It was alleged that the success of a company depends on its assistants, and that this involves care in selection and supervision of their work and that the assistants' position with the company is dependent on their good work and conduct. It was urged that the company's size and stability provided a guarantee that complaints would be investigated and claims considered and (if *bonâ fide*) settled. The larger the business the more valuable and susceptible is the reputation it has to preserve. Advertisements were claimed to have a popularising effect upon certain sections of the people not reached by the private qualified dentist.

We have thought it desirable to set out somewhat fully the claims of the Macdonald Manufacturing Co. before reviewing the suggestions which have been made to us for remedying the undoubted abuses which exist in the operations of some dental companies.

The Committee are of opinion that gross abuses have been associated with the practice of dentistry by Incorporated Companies; that these abuses are of the nature both of malpraxis and of fraud and that an alteration of the law is needed to remedy them.

22. Various suggestions have been made to us for dealing with these abuses. Sir Donald Macalister referred us to the proposals of the General Medical Council which were in agreement with the terms of a Bill as introduced into the House of

* This might be met by requiring them to make a deposit to meet claims, on the model of Insurance Companies. See Assurance Companies Act, 1909, Sec. 2 (1).

Lords in 1907, "Dental Companies (Restriction of Practice) Bill." This Bill was introduced by a private member. As introduced it provided for the prohibition of dental work by incorporated companies.

The Select Committee considering the Bill, after having heard witnesses representing the General Medical Council, the British Dental Association, the companies practising dentistry, and other interested persons, inserted an amendment in the Bill which had the effect of recognising and protecting the vested interest of dental companies which had, for a period of 5 years before the passing of the Act, been *bonâ fide* engaged in carrying on the business of dentistry or dental surgeons or dental practitioners. The Bill did not proceed further during that session.

23. The General Medical Council, we were informed by Sir Donald Macalister, favours an alteration of the law which would provide for the total prohibition of dental companies which, in the name of the Company, and not in the name of the individual operator, practise upon the public. The Council hold a similar view as regards medical companies. Mr. Norman Bennett, on behalf of the British Dental Association, expressed the view that all dental companies should be prohibited. There was no objection to permitting existing dental companies to practise for a strictly limited period in order to enable the shareholders to take out their capital from the company, but after a certain date, company dental practice should, he considered, entirely cease. Mr. Butterfield, the secretary of the Incorporated Dental Society, was also in favour of the prohibition of dental practice by companies after the lapse of a period of 5 years. He thought that existing companies should be allowed to practise for that period, and the managers and operating principals of branches should at once be admitted to the dental register and allowed to practise in their own name and employ qualified assistants at the end of the period.

24. The Macdonald Manufacturing Company, Ltd., suggested in the event of any restrictive legislation being recommended:

(a) That so far as Dental Limited Companies are concerned all Directors and assistants who have had practical experience in dentistry should be exempted from restrictions and should be registered and thenceforward no person or persons should be permitted to carry on Dentistry without being upon the register.

(b) That Limited Companies should be allowed to continue and should be entitled to employ qualified assistants.

(c) That no Limited Company partnerships or person should be at liberty to use the name of dentist or dental practitioner or any name with a description implying that the business is carried on by a person or persons registered under the proposed act, unless the dental work is *bonâ fide* conducted by persons who are duly registered thereunder.

25. The Committee have given very careful consideration to the different representations that have been made to them. They have also had regard to the fact that at the present moment there is no act prohibiting the formation of incorporated companies for a lawful purpose. They consider that if the evils that have undoubtedly become associated with company dental practice can be prevented by means other than by total prohibition of such practice it is better to adopt this course than to suggest an alteration of the Companies Act for which there is no precedent. It would probably be difficult to confine prohibition of company practice to dentistry alone. A precedent of this nature would be quoted for use in other professions and trades, and would require to be considered by Parliament from a wider standpoint than that of dentistry. The Committee have, therefore, approached the problem from the point of view of control rather than from that of total prohibition.

26. Section 3 (4) of the Poisons and Pharmacy Act, 1908, affords a precedent for control. This section is in the following terms:

(4) A body corporate, and in Scotland a firm or partnership, may carry on the business of a pharmaceutical chemist or chemist and druggist:

- (a) if the business of the body corporate, firm or partnership, so far as it relates to the keeping, retailing, and dispensing of poisons, is under the control and management of a superintendent who is a duly registered pharmaceutical chemist or chemist and druggist whose name has been forwarded to the registrar appointed under the Pharmacy Act, 1852, to be entered by him in a register to be kept for that purpose, and who does not act at the same time in a similar capacity for any other body corporate, firm, or partnership; and
- (b) if in every premises where such business as aforesaid is carried on, and is not personally conducted by the superintendent, such business is *bonâ fide* conducted under the direction of the superintendent by a manager or assistant who is a duly registered pharmaceutical chemist or chemist and druggist, and whose certificate of qualification is conspicuously exhibited in the shop or other place in which he so conducts the business.

A body corporate, and in Scotland a firm or partnership, may use the description of chemist and druggist, or of chemist or of druggist, or of dispensing chemist or druggist, if the foregoing requirements as to the carrying on of the business are observed, and if the superintendent is a member of the board of directors or other governing body of the body corporate, or of the firm or partnership, as the case may be.

Subject as aforesaid, section twelve of the Pharmacy Act, 1852, and sections one and fifteen of the Pharmacy Act, 1868, shall apply to a body corporate, and in Scotland to a firm or partnership, in like manner as they apply to an individual.

27. The Patents and Designs Bill of 1917 (Bill No. 106) introduced by Sir Albert Stanley also affords in Section 17 a precedent for control. The section is in the following terms:

17. For section eighty-four of the principal Act, which relates to the registration of patent agents, the following section shall be substituted:

“84. (1) No person shall describe or hold himself out, or permit himself to be described or held out, as a patent agent, unless:

- (a) in the case of an individual, he is registered as a patent agent in the register of patent agents;
- (b) in the case of a firm, every partner of the firm is so registered;
- (c) in the case of an incorporated company, every director and the manager (if any) of the company is so registered.

(2) Every person not already registered as a patent agent who proves to the satisfaction of the Board of Trade that prior to the first day of August, nineteen hundred and seventeen, he has been *bonâ fide* practising as a patent agent shall be entitled to be registered as a patent agent if he makes an application for the purpose within twelve months after the said first day of August, unless after giving an applicant an opportunity of being heard the Board of Trade are satisfied that he has whilst so practising been guilty of such misconduct as would have rendered him liable, if his name had been on the register of patent agents to have his name erased therefrom.

(3) If any person contravenes the provisions of this section he shall be liable on conviction under the Summary Jurisdiction Acts to a fine not exceeding twenty pounds, and in the case of a company every director, manager, secretary, or other officer of the company who is knowingly a party to the contravention shall be guilty of a like offence and liable to a like fine.

(4) For the purposes of this section the expression "patent agent" means a person, firm or company carrying on in the United Kingdom the business of obtaining patents in the United Kingdom or elsewhere."

28. The Committee are of opinion that the abuses of company dental practice, which have been brought to their notice, would be effectively prevented if dental companies were subject to a somewhat similar system of control to that set out in paragraph 27. The Committee, therefore, recommend that no incorporated company shall be permitted to practise dentistry unless the operating staff, each of the directors, and the manager (if any) of the company are registered. The business of the company should be restricted to the usual work of a dentist and not be combined with that of any other business or trade. Any contravention should be punishable on conviction under the Summary Jurisdiction Acts by the levying of a fine not exceeding twenty pounds on every director, manager, secretary, or other officer of the Company who is a party to the contravention. The registered directors, manager, and operating assistants employed by Companies would be subject to the same control as individual dentists, and liable to removal from the register. On removal from the register they would no longer be able to act as dentists either in an individual capacity or as servants of a company.

29. As regards existing dental Companies the Committee think that any manager or director who has *bonâ fide* been acting in that capacity for a period of 5 years before the date of this report should be entitled to be specially registered in a separate portion of the Dentists Register. Such registration should constitute a right to take part in the management of a dental company, but should not entitle the person registered to act as a dentist, unless he were also registered as a dentist. As regards the operating assistants and others employed by existing companies in performing dental operations they should be able to obtain registration on the same terms as are recommended for other unregistered practitioners.

The Committee in short recommend that Dental Companies shall not be prohibited from practising dentistry but shall be controlled, all the operating and managing staff being required to be registered dentists, and special provision being made to meet the case of existing companies. Companies practising dentistry should not carry on any other business or trade.

30. The Committee have considered the question of the financial liability of dental companies and their servants to patients for negligence and have received the opinion of the Solicitor-General upon it. It is in the following terms:

Dentists.

"Whether a dentist (registered or unregistered) employed by a company (as a servant) could be sued for damages by a patient injured through his negligence, as an alternative to suing the company, or whether an action would lie against the company only."

Opinion of the Solicitor-General.

"In my opinion the person injured would in the circumstances referred to, have a cause of action against either the dentist or the company or both. Every agent or servant is personally liable for his own torts, and if, in virtue of the doctrine 'respondent superior,' his principal or master is also liable, the liability is joint and several. Either may be sued separately or both may be sued jointly.

(Signed)

"GORDON HEWART.

"Law Officers' Department,
12th March, 1918."

Having regard to this opinion and to the conditions under which it is recommended that dental companies shall in future work the Committee think that the interests of the public will be adequately safeguarded.

Section IV.—The Evils arising from Dental Practice by Unregistered Practitioners.

31. In considering "the extent and gravity of the evils connected with the practice of dentistry and dental surgery by persons not qualified under the Dentists Act" it is necessary always to bear in mind the fact that **under the existing law any person, however ignorant, unskilled, untrained, can practise dentistry and inform the public by advertisement and otherwise that he practises dentistry. The only protection the public has is an action for damages in case of injury or the fear of a possible prosecution for manslaughter in case of death.**

32. In view of the legal position the persons who have taken up the calling of dentistry now comprise a body of men representing every degree of skill from the totally uneducated unskilled men to the highly skilled qualified practitioner. When a particular evil associated with an unregistered practitioner is mentioned it must always be considered with reference to the possibility that the evil may be multiplied many times over by the number of practitioners of similar calibre who are practising dentistry. On the other hand the evil may not find a place at all among unregistered practitioners of reputable standing. In order to investigate the subject thoroughly the Committee sent a circular letter to each representative body, that in the opinion of the Committee was in a position to furnish them with information on the subject. Each reply on receipt was carefully considered in detail and, if it was thought that additional useful information would be acquired by oral evidence, witnesses were invited to attend before the Committee.

We review the main evidence received before stating our conclusions.

33. *The General Medical Council* in their reply laid stress on the following points in connection with dental practice by unregistered persons:

- (1) The great and very rapidly increasing number of unregistered practitioners.
- (2) The evils of company dental practice of the one man type in which the remaining signatories to the memorandum of association are persons of straw. The effect of this is to annul the personal responsibility of the prime mover and to put him to a large extent out of the reach of the law.
- (3) Canvassing.
- (4) Extensive advertising, often of an untruthful character, which is greatly resorted to.
- (5) Administration of anæsthetics by persons devoid of all medical knowledge and training, without the observance of those precautions upon which safety is known to depend.

The Council by reason of the judicial nature of its functions was not in a position to furnish details of individual cases except when on the investigation of a complaint against a registered practitioner facts were elicited owing to the registered practitioner being "mixed up with an unqualified and unregistered person." The Council furnished us with the details of one such case which came before them in this connection.

34. *The British Dental Association* submitted to the Committee a confidential memorandum setting out very fully the different considerations bearing upon the extent and gravity of the evils connected with unregistered dental practice. After reviewing the legal position the following opinion is expressed:

"It follows, therefore, that the most widespread and misleading advertisement of claims to special skill and capacity in dentistry do not render the person employing them liable to penalties, provided that he does not claim 'special qualification' by naming a particular degree, diploma or so forth."

The Association submitted a list of successful prosecutions against the use of titles implying "special qualification." Among such titles are the following:

Dentist; Dentist and LDS.; D.D.S., U.S.A.; Dental Practitioner; Dental Surgeons, Outred L.D.S.

35. In contradistinction to the abovementioned titles, the use of which by unregistered practitioners can be prevented, the Association gave us a list of descriptions and titles which are used with impunity by unregistered practitioners or dental companies. The list was as follows:

- | | |
|---|--|
| "Dental Specialist." | "Experts in Dental Surgery." |
| "Dental Consultant." | "Dental Specialist of Anglo-American Reputation." |
| "Dental Expert." | "Exponent of Modern Dentistry." |
| "C.D.S. (Chemists' Dental Society)." | "One of the Greatest Experts in Crown, Bridge and Bar Work." |
| "D.E., D.A." | "Finished Expert." |
| "S.M.D." | "Dental Operator." |
| "Specialist in Operative and Prosthetic Dentistry." | "Dental Pioneer." |
| "Odontologist." | "Expert Adapter of Teeth." |
| "D.S. Specialist." | "Dental Surgery." |
| "Teeth Specialist." | "Dental Institute." |
| "M.O.F.O." "Expert in Modern Dentistry." | "American Dentistry." |
| "Experts in the Science of Teeth Treatment." | "English and American Dentistry." |
| | "Surgical Dentistry." |
| | "Modern Dentistry." |

In view of what is permissible and what is not, in the matter of title, the Association state it is "impracticable for the general public to know whether they are to be treated by properly qualified persons or not." The number of unregistered practitioners is stated considerably to exceed the number of registered practitioners, and the classes more particularly affected by unregistered practice to be the poor, and those of limited means among the wage and salary earning classes. These specially need and should obtain protection.

36. The Association supplied lists not pretending to be exhaustive as follows:

1. Cases (publicly reported) of claims for damages for injuries, unskilful treatment, &c., by unqualified men.
2. Cases (publicly reported) of deaths occurring after administration of cocaine or of anæsthetics containing cocaine by unqualified men.
3. Cases (publicly reported) of deaths following operations by unqualified men, other than cases in which cocaine was used.
4. Cases (not publicly reported) of complaints of injuries and useless dentures and of claims for damages settled by payments by unregistered men.
5. List of some dental companies registered (under the Companies Act) in recent years.
6. (a) Canvassers' cases (publicly reported).
(b) Advertisements for canvassers.
7. Previous occupations of some unregistered men now practising dentistry.

37. The following are six cases selected from the first list.

1. Boyle Quarter Sessions.—Judgment against London and American Dental Co. for return of £8, money paid for set of teeth. Evidence of a former

employee that there were two offices, one under the above name, the other under another name. He worked in both. The Judge informed the plaintiff that "he had fallen among thieves."—*Irish Independent*, Oct. 21, 1908.

2. Maidstone County Court.—£14 10s. damages against G. C. Smith for negligence. Inflammation of the mouth—tooth broken off. Statement that Smith had been twice fined for calling himself a dentist, had then turned himself into a "Limited Company," and then, when an injunction against the Company had been obtained by the British Dental Association, had started calling himself a dentist again. The Judge desired to draw attention to the disgraceful state of affairs disclosed by the evidence.—*Kent County Standard*, Sept. 25, 1909; and for Chancery Proceedings see report in L.R. 1909, 2 Ch. 524.
3. Cardiff County Court.—£11 damages and costs against Templar Malins for negligence, excessive bleeding. Defendant stated he extracted 500 teeth a week.—*South Wales Echo*, Jan. 6, 1910.
4. Clerkenwell County Court.—£20 damages and costs against Williams' Dental Institute, King's Cross. Tooth broken, socket of gum crushed. Gum and roof of mouth had wounds.—*Islington Daily Gazette*, Dec. 2, 1910.
5. Hull County Court.—£15 damages against T. H. Jubb for unskilful treatment. Fourteen teeth were broken by operator leaving nerves exposed. The operator was 21 years of age, had never attended any hospitals or lectures on dentistry. He had often extracted fourteen teeth at a time. The Judge stated there was serious negligence.—*British Dental Journal*, 1912, pp. 185 *et seq.*
6. Glasgow Sheriff's Court.—A. Murray recovered £50 damages and expenses against R. B. Mackie. Jaw bone broken, septic poisoning and hæmorrhage. Defendant had the words "Dental Surgery" on stair outside his rooms and "Dental Rooms" on his door. Pursuer did not know defender was unqualified. Defender appealed and his appeal failed.—*British Dental Journal*, 1915.

38. The inferences drawn by the British Dental Association from the list of injuries, &c., submitted to the Committee are as follows:

- (a) Injuries to the mouth and jaws owing to unskilful operations are frequent.
- (b) Teeth are frequently broken, cut or snapped off, owing to lack of necessary surgical knowledge and skill.
- (c) Septic poisoning is frequently caused by unskilful work and neglect or ignorance of antiseptic methods.
- (d) There is evidence of considerable injury to the teeth and health of patients; unnecessary violence is often employed.
- (e) Great discomfort is caused by ill-fitting dentures, and the consequent impossibility of adequate mastication of food exercises a prejudicial effect on the health.
- (f) Deaths from the unskilful administration of anæsthetics are not uncommon.
- (g) Cocaine poisoning is frequent.
- (h) The practice of injecting local anæsthetics, such as cocaine and other dangerous drugs, into the gums gives rise to cases of poisoning owing to instruments not being properly sterilized; such practice is calculated to lead to the transmission of disease from one patient to another.
- (i) The ignorance of the operators is fully brought out; instances are given in which colliers, clerks, fire-beaters and others have taken up the practice of dental operations with no previous training.

- (j) The use of bad materials for dentures is frequently complained of, especially in cases brought against dental companies.
- (k) Sound teeth are frequently needlessly extracted to be replaced by false.
- (l) The employment of canvassers undoubtedly leads to (1) misrepresentation as to the qualification of the employers of the canvassers, and misrepresentation of the qualifications of the canvassers themselves (who are sometimes operators), (2) patients being induced to have sound teeth needlessly extracted (the canvassers being paid commission on the amount of orders they secure).
- (m) In the case of dental companies registered under the Companies Acts, great difficulties are often put in the way of a patient seeking to enforce any remedy for injuries suffered or money paid for useless dentures.
- (n) Large profits are made by unqualified practice, thus inducing a constant flow of recruits to its ranks.

The Association considers that these cases afford evidence and are symptomatic of a very large amount of bodily injury, suffering, and pecuniary loss inflicted upon the public by unregistered persons practising dentistry.

39. The Association also specially referred to the evils of the canvassing system of dental companies, and of the hindrance to the recruitment of the dental profession which unqualified practice sets up.

We heard in evidence:

Mr. T. A. Coysh, L.D.S. (Eng.),

Mr. E. Y. Richardson, L.D.S. (Edin.),

Mr. B. J. Wood, L.D.S. (Eng.),

as representing the Association on this part of the Association's statement. In their evidence the witnesses amplified the written statements which had been placed before us and illustrated from their own experience the evils associated with unregistered practice. Mr. Coysh represented to us that the Dentists Act was a failure in that it was now practically impossible for the uninstructed public to distinguish between the titles reserved to the registered dentist and the many misleading titles adopted by the unregistered practitioner. He expressed the opinion that it was even doubtful if the use of the title "Dental Surgeon" could be confined to the registered practitioner. As Chairman of the Penal Cases Committee of the British Dental Association he was able to bring before us very clearly the legal position of registered and unregistered practitioners as it exists at the present time. He claimed that the Act was a complete failure so far as protecting the public against the evils resulting from unqualified practice.

40. Mr. Richardson, the Secretary of the Northern Branch of the British Dental Association and on the staff of the Newcastle-on-Tyne Dental Hospital, gave us many instances of gross personal injuries resulting from dental practice by unregistered practitioners. He explained the methods adopted for obtaining high fees by some unregistered practitioners, and gave instances of bad work in denture construction. The following extracts from Mr. Richardson's evidence illustrate the nature of some of the unqualified practice that prevails in the north of England:

"I have cases I can cite the names and addresses of, of men who were drillers and turners and butchers at the outbreak of the war, who to-day are doing what are tantamount to major dental operations upon the public."

* * * * *

"The man I am specially citing employed within two months 20 canvassers. They were drawn from the very lowest types of workmen, such as casual labourers and so on. Six of those canvassers in my own area, within two months,

were going about with a bag full of instruments and were operating on people in their homes."

* * * * *

"The practice in vogue in the north is for a canvasser to go round with a canvasser operator, a man who has been a canvasser previously. They usually go round together, and the man who is a canvasser calls at the houses to ask the tenants whether they wish for teeth to be extracted or supplied. In the meantime the operator is probably operating at another house. The canvasser watches the operator here and there, and in the course of two or three weeks he himself becomes an operator canvasser. Usually they hunt in couples in the first three months. That is the class of practice we have chiefly in the north."

41. In contrast with the unregistered practitioner of the type mentioned Mr. Richardson referred to the ethical unregistered practitioner in the following terms:

"With rare exceptions, an ethical unregistered practitioner is a man who has served a proper apprenticeship to a qualified dental surgeon, and he has naturally imbibed some of the professional etiquette of the qualified man with whom he has served. He is able to construct proper and skilful dentures and, naturally, having been gifted to use his hands from comparatively early years, he speedily acquires a certain amount of dexterity in simple operative procedures."

Mr. Richardson made it quite clear that the grossest evils resulting from unregistered practice are mainly associated with the canvassing, advertising class of unregistered practitioner.

42. Mr. B. J. Wood, lately the Hon. Secretary of the Eastern Counties Branch of the British Dental Association, and School Dental Officer of the Kettering Urban Education Authority gave evidence which confirmed that given by Mr. Coysh and Mr. Richardson as to the increase in practice by unregistered persons. He was of opinion that the increase during recent years has been out of proportion, either to the increase in registered practice, or to the growth of the population, the increase in practice by unregistered persons "being mainly by the addition of the most undesirable sort of unqualified men." He regarded practitioners who had been dentists' mechanics as constituting the greater part of the better grade of unregistered practitioner.

He strongly emphasised the point that practice by unregistered persons was mainly confined to extractions and the provision of dentures, and that very little true conservative dentistry was performed, and that the existence of a body of practitioners mainly interested in extractions and dentures was a very real danger to conservative dentistry. He informed us that "he had never seen a case of fillings done by an unregistered person for school children."

43. *Mr. J. Towart and Mr. G. H. Watson, representing the Medical and Dental Defence Union of Scotland*, gave very similar evidence as to the growth of practice by unregistered persons which was inhibiting the normal growth of the dental profession. They pointed out the evil effects of wholesale extractions by unregistered practitioners. In this connection Mr. Towart informed us that the Union was constantly asked the question whether they could not "help medical men in some way to protect their patients from this wholesale extraction of good teeth . . . for the purpose obviously of putting in others."

44. *The British Medical Association* has furnished us with a valuable memorandum. The Association sent out to their various divisions and branches a circular letter of enquiry requesting the information which the Council of the Association thought would be most helpful to the Dentists Act Committee. Replies were received from 68 areas in England, Wales and Scotland representing areas

varying in size from a county borough to a combination of two counties. The replies have been carefully summarised for our use by Dr. Alfred Cox, O.B.E., the Medical Secretary of the Association. The information in the summary is so complete we have not considered it is necessary to ask the Association to give oral evidence.

In submitting the memorandum to the Committee the following opinions are expressed:

"The replies are not so numerous or so representative of large bodies of medical opinion as they would have been in normal times, but they are numerous and authoritative enough to justify the Association in placing them with confidence before your Committee as generally representing the opinion of the medical profession."

* * * * *

"In the opinion of the Association the result of the inquiry shows that the present state of the dental services is most unsatisfactory and inadequate."

45. The following extracts from the memorandum indicate generally the nature and extent of the evils of unqualified dental practice as elicited by the replies received to specific questions asked by the Association:

Question 1.—"Is it your opinion that it is the usual practice of unqualified dentists to extract teeth and provide artificial dentures instead of undertaking conservative dentistry?"

73 replies were returned.

67 of these stated that "such was in their opinion the usual practice of unqualified dentists."

* * * * *

Question 2.—"Do you know of any unqualified dentists who recommend or carry out systematically conservative dentistry?"

65 replies were returned:

39 stated that they knew of none;

17 replied "few," "very few," or "very rare indeed";

9 replied that they knew of instances in which unqualified persons carried out or attempted to carry out conservative dentistry.

* * * * *

Question 3.—"State evils known by you to arise out of the effects of inferior dentistry and the loss of natural dentition:

(a) In the production of chronic gastritis and indigestion, with consequent defective nutrition;

(b) In the loss in economic value of such persons by reason of this defective health and especially women engaged in work either domestic or industrial, and nursing mothers."

(a) 43 replies were returned:

37 laid particular stress on this evil;

(b) 47 replies:

40 express the opinion that such economic loss is "very great" or "great" or "serious."

"The following examples of the immediate cause of this loss are given:—Severe sepsis, hæmorrhage, necrosis, fracture, dislocation, non-diagnosis of empyema of antrum, good upper teeth cleared and lower bad teeth left because former were easily extracted. Guildford expressed the opinion that the greatest evil is the inability of unqualified practitioners to

educate their patients in the care of their teeth and their ignorance of the serious evils that follow toxic infections from teeth and gums. Several areas express opinion that servant girls are chief sufferers."

* * * * *

Question 7.—"State any other facts or opinions which occur to you as likely to assist the Association in furnishing the Departmental Committee with evidence on the two heads mentioned in paragraph 1 of the letter:

(1) The extent and gravity of the evils connected with the practice of dentistry and dental surgery by persons not qualified under the Dentists Act."

23 express general opinion that the effects of unqualified dental practice on public welfare are "definite" or "great" or "scandalous";

2 consider evils may easily be exaggerated.

46. The following remarks from other areas may be quoted:

Northants.—"Even when they attempt conservative treatment, unqualified men as a class have no knowledge of the methods of treating the pulp and frequently the result is alveolar abscess or septic infection. A case of rheumatoid arthritis was quoted where several teeth had been filled by an unqualified man; pulp had necrosed and constituted a septic focus which almost certainly was the determining factor in production of the arthritis. An ophthalmic surgeon quoted cases of eye affection similarly due to septic infection."

Glasgow South.—"Disease of lips, gums, jaws, antral disease, cancer, syphilis, &c., not recognised by unqualified men, with disastrous results."

Nuneaton.—"Unqualified may be divided into 2 classes:

- (a) Who have had some dental training as mechanics to qualified dentists;
- (b) Who have had no previous training."

Many of former do good work, especially in making and fitting artificial dentures; generally work on their own account and are not employed by a company.

Of the second class it would be hard to speak too severely. They are employed by dental companies whose trade-names are constantly changing and whose one object is to make money. The work of these men is uniformly bad. Procedure usually followed:—Flamboyant advertisements are distributed broadcast, the so-called "operators" of the company canvass the villages from door to door. Young women with indifferent front teeth are their chief victims. They extract teeth in order to sell artificial dentures and in some cases even cut off teeth which are difficult to extract level with gums so as to fit the new dentures. Nothing but harm can come of the work of these men who do not in any way study the welfare of their victims. If the "company" gets into trouble through the bad work its name is changed or it moves to another district."

Morpeth.—"Almost all local dental work done by unqualified men and women with practically no training or anatomic knowledge. Their motto is "Non arte sed vi." Mouths are cleared indiscriminately, and rubbishy dentures supplied at fancy prices (generally paid in weekly instalments). Septic jaws frequent."

Exeter.—"As training of unqualified men must be in mechanical dentistry only, unqualified practice almost necessarily involves extraction of teeth more or less bad to make room for artificial dentures."

Gateshead.—"Lucrative nature of trade attracts all sorts of unscrupulous persons at terrible cost to the community."

47. *The London and Counties Medical Protection Society, Ltd.*, in a memorandum submitted to the Committee drew attention to the objectionable advertising

resorted to by many unregistered dentists of which "a very large proportion contain lying statements that deceive the public." The effect on the registered dental profession was to lower that profession in public estimation. The Society expressed the view that "Good social status does more than anything else to attract good men into a profession, and the status of a profession which, as far as the public are concerned, is regarded as including vulgar impostors who take upon themselves to practise dentistry without training or qualification, can never be what is due to men who have become properly qualified as dental surgeons."

The Society brought to our notice specific instances of injury resulting from unregistered dental practice and instances of blatant advertisement tending to deceive the uninstructed public. Mr. P. Sidney Spokes, M.R.C.S., L.D.S., J.P., who gave evidence before us on behalf of the Society, confirmed the opinion that had been expressed by other witnesses, that the increase of unregistered dental practice in recent years had been mainly "on the side of the absolutely unscrupulous" people who have seen an opportunity of coming in and exploiting the poorer people throughout the country. Mr. Spokes agreed that probably the position of the better class of unregistered practitioner had been prejudiced by this type of competitor.

48. *The Incorporated Dental Society, Ltd.*, submitted to us in a memorandum some valuable evidence from the point of view of the better class of unregistered practitioner. The Society represented that the evils resulting from unregistered practice had been grossly exaggerated and that "the incidents of malpractice, negligence, and unskilful treatment must be considered as exceedingly rare in comparison with the large number of persons receiving dental treatment." It was represented that an unregistered practitioner was at a great disadvantage in defending an action in comparison with a registered dentist and instances were quoted in support of this view. Our attention was also directed to the fact that "a substantial number of claims are annually made against registered dentists." The Society, however, did not deny that uncontrolled unregistered practice of an inferior type had produced certain evils. The Society described the employment of canvassers as a "pernicious practice," the methods adopted being regarded as "unscrupulous and often dishonest." The canvassing system, moreover, was regarded as facilitating the increase in this undesirable kind of dental practice.

The Society mentioned other "evils" associated with some varieties of dental practice, viz.:—travelling assistants and itinerant vendors. Reference is also made to the "Exploitation of dentistry by a few unscrupulous persons purely as financiers" and to the "lack of proper supervision and control." The Society has framed byelaws for its members prohibiting canvassing and payment of secret commissions and regulating advertisements, &c. Mr. Butterfield in his evidence regarded the "evils" associated with unregistered dental practice as "due to the lack of control or the power of control" and agreed that evils are very likely to result from the practice of dentistry by the totally unqualified and totally uneducated.

49. Before stating the conclusions we have reached there is one particular "evil" we would wish to emphasise. It has been represented to us by practically all witnesses that the main business of most unregistered practitioners is extracting teeth and substituting dentures, whereas the main business of the registered dentist is teeth preservation. The unregistered practitioner explains this by stating that the working classes, who are his main clients, do not value conservative dentistry, and will spare neither the time nor money for teeth preservation. The registered dentist on the other hand states that the situation arises from the fact that the majority of unregistered practitioners are untrained and unskilled in conservative dentistry, which requires surgical knowledge, only to be acquired by an adequate course of training. Conservative dentistry, moreover, besides being less remunera-

tive, requires the expenditure of considerably more time on the dentist's part than extracting teeth and providing dentures.

50. **Witnesses representing both the registered and unregistered agreed that in the public interest the preservation of the natural teeth should be the first aim of the dental profession.** Unfortunately the law as it at present stands affords a strong incentive to the unregistered practitioner to throw all his energies into providing artificial teeth. It is only for such work he is able to recover payment, as under Section 5 of the Dentists Act, 1878, an unregistered practitioner cannot recover in any Court a fee for the performance of any dental operation or for any dental attendance or advice. The general effect of this clause has been against the public interest and has tended to separate the registered and unregistered practitioners into two hostile camps, the one striving to maintain the true aim of dentistry, viz.: the preservation of the natural teeth, and the other to laud the advantages of artificial teeth. Hence the show cases of artificial teeth of all kinds and the "free advice" notices to be found outside the premises of certain unregistered practitioners.

51. We have very carefully weighed the evidence both written and oral which has been submitted to us and the conclusions we have arrived at are the following:

The practice of dentistry and dental surgery by persons not qualified under the Dentists Act is mainly responsible for the following evils:

- (a) Lowering the social status and public esteem of the dental profession.
- (b) A great shortage of registered dentists owing to the unattractiveness of the profession.
- (c) Inability by the general public to distinguish between a registered and unregistered practitioner.
- (d) The dental treatment of the public being largely in the hands of uneducated, untrained and unskilled persons.
- (e) Grave personal injury on account of lack of skill and of technical knowledge.
- (f) Extractions of sound and only slightly decayed teeth.
- (g) Application of artificial teeth over decayed stumps and into septic mouths.
- (h) The existence in the public mind of the belief that there is no advantage in preserving the natural teeth and that these should be allowed to decay and when trouble arises have all the teeth out and substitute a plate of artificial ones.

52. We have had a certain amount of evidence suggesting that venereal disease is likely to be spread by dental operators who are ignorant, or disregard aseptic methods. No actual case which we can regard as proved has, however, been brought before us. In the nature of things, adequate and satisfactory proof would be difficult to obtain, and we are content to express the opinion that the risk is not wholly negligible.

Section V.—Dental Disease in Relation to the Health of the People.

53. The Committee have realised that it would be unable to report upon its reference until it had taken evidence of the effect of dental disease upon the general health, and of the condition of the teeth of different age groups of the population as regards dental decay.

The number and kind of dentists required in the future will be mainly conditioned by these two factors.

(a) EFFECT OF DENTAL DISEASE ON HEALTH.

54. The evidence we have received under this heading is contained in replies to circular letters sent out by the Committee to representative bodies, insurance

committees, and approved societies. From its nature it is necessarily mainly medical in character, being furnished by medical practitioners directly or founded on reports of medical practitioners. We proceed to review the chief evidence we have received.

THE BRITISH MEDICAL ASSOCIATION.

55. As a result of enquiries addressed to the different divisions in England and Scotland the Association expressed the opinion:

"That a considerable economic loss arises from the effect of dental disease owing mainly to the reflex influence thereof on the general bodily health, particularly through digestive trouble and resulting anæmia. The effect is most noteworthy in women."

"Of 43 replies received by the association as many as 37 laid particular stress on the production of chronic gastritis and indigestion as arising from the effects of inferior dentistry and the loss of natural dentition."

APPROVED SOCIETIES UNDER THE "NATIONAL INSURANCE ACT, 1911."

56. Our attention had been directed to the following paragraph in the report of the "Departmental Committee on Sickness Benefit Claims" [Cd. 7687]:

"193. . . . It is stated that the absence of any provision for dental treatment—which, it may be observed, is a possible additional benefit in the event of a society realising a surplus—has produced much sickness of various kinds resulting in a drain on the sickness benefit funds, which would have been avoided had there been provision for the treatment of teeth. Inattention to teeth results in certain cases in prolonged gastric illnesses, and in a very large group of cases, on which benefit is being paid, no permanent cure is possible until the teeth have been attended to. Even in the event of decayed teeth being removed, there is ground for believing that there is no sufficient means by which artificial dentures can be supplied to insured persons, either gratuitously or at a reduced cost."

57. In view of this opinion we sent a circular letter of inquiry to a number of approved societies accompanied by a "questionnaire." Two of the questions were in the following terms:

"1. Have you had cases brought to your notice in which *neglect* of teeth trouble has led to ill-health?"

2. In particular has your attention been directed to the following diseases being attributed to or aggravated by defective teeth?

- (a) Anæmia.
- (b) Gastric troubles.
- (c) Debility.
- (d) Tonsillitis.
- (e) Neurasthenia.
- (f) Rheumatism."

The replies received to these questions afford strong ground for believing that much ill-health leading in many cases to chronic invalidity is to be ascribed directly or indirectly to dental neglect.

58. The following are some of the opinions expressed in the replies received by the Committee:

Prudential Approved Societies (Membership, 3,000,000).

"The following sums are generally the opinions of several of our medical referees who have examined some thousands of cases for us in all parts of England.

Neglect of teeth trouble is the cause of quite half of the ill-health found among the industrial classes, and of these a large majority in young women.

The chief sequelæ of dental caries and oral sepsis are found to be (in the following order of importance):

- (a) General debility (the starting point).
- (b) Anæmia (especially in young women).
- (c) Rheumatism, including premature senility, myocardiac and arterial degeneration (in older people, especially men).
- (d) Gastric troubles, including chronic gastritis and ulcer, appendicitis and chronic constipation.
- (e) Neurasthenia.

These conditions (a—e) often co-exist, in fact, as a rule two or more of them are present in all cases and it is rare to find a patient suffering from oral sepsis who is not also neurasthenic to a greater or lesser degree.

Tonsillitis is not found to be a common sequela of dental caries, and one is inclined to remove the disease from the list; on the other hand a large number of diseases of auto-intoxication, such as Graves's disease, must undoubtedly count oral sepsis as an etiological factor in their incidence."

The opinion is also expressed that there can be no doubt that there are thousands of persons receiving sickness benefit who would not be doing so had they received proper dental treatment.

National Federation of Women Workers (Membership, 20,000).

"The absence of provision for Dental Treatment under the National Health Insurance Act has resulted in many claims upon the Sickness Benefit Funds of the Society. Many claims would never have been made, while a still larger percentage have been prolonged in duration by the fact that the member has been unable to obtain dental treatment prescribed as necessary by the panel doctors.

Anæmia, gastric troubles, rheumatism, debility, tonsillitis, neurasthenia, can, according to the panel doctors, be traced to the need for dental treatment, and cases have been aggravated by inability to obtain it; cases of anæmia, gastric trouble, and rheumatism being specially prominent."

Domestic Workers' Friendly Society (Membership—women only, 63,000).

The following replies were received to the two questions asked by the Committee:

"Question 1.—Yes, repeatedly. As this Society ascertained by independent valuation that it would have a substantial surplus, grants have been made to the Domestic Servants' Association to provide its members with free dental treatment, including the supply of new dentures at half cost.

A number of patients, after the completion of dental treatment, have stated that they have been much improved in health thereby. Many of these had been undergoing medical treatment for various complaints, but stated that this only gave temporary relief.

Question 2.—The diseases mentioned in this list are those most commonly met with as being caused or aggravated by an unhealthy condition of the mouth. Our members, owing to the nature of their occupation, are peculiarly liable to gastric troubles and carious teeth. Many apply for dental treatment on the advice of their doctors, in order to bring about the cure or relief of these complaints."

INSURANCE COMMITTEES UNDER THE NATIONAL INSURANCE ACT, 1911.

59. The Committee sent a letter of inquiry (Para. 57) to representative Insurance Committees similar to that sent to Approved Societies. Insurance Committees

administer Sanatorium Benefit, and the reply received from London dealt with the relationship between tuberculosis and neglected dental decay.

The London Insurance Committee expressed the following opinion:

"I am directed to state that there is a definite relation between "un-cared for" mouths and pulmonary tuberculosis. Unsound teeth and septic conditions of the mouth predispose to tuberculous infection and render recovery more difficult when the disease exists. The experience of the Sanatorium Benefit Sub-Committee is that very many consumptives recommended for benefit have need of dental treatment."

60. At the suggestion of the London Insurance Committee we invited the Medical Adviser of the Committee, Dr. Noel D. Bardswell, M.V.O., to supply us with further information on the subject. Dr. Bardswell, in his reply, expressed the following opinion:

"My experience as Medical Adviser to the L.I.C. is that amongst consumptives of the working classes, deficient dentistry and septic mouths are very commonly met with. These conditions prejudice the prospects of recovery, and almost certainly are a predisposing factor to infection with tuberculosis. Further, that in my judgment provision of efficient dental treatment of this class of the community is quite inadequate. At the same time I would say that the lack of facilities for dental treatment does not entirely account for the kind of mouths that I so constantly see. Ignorance and indifference as to the care of the teeth is a large factor."

61. The Aberdeenshire Panel Committee, the County of Durham Insurance Committee, the Birmingham Panel Committee and the Edinburgh Insurance Committee all stated that cases had been brought to their notice in which neglect of teeth trouble has led to ill-health, and they all agreed that the diseases mentioned in Question No. 2 were attributed to or aggravated by defective teeth.

62. The Manchester Insurance Committee circulated a copy of the "questionnaire" to every doctor on the "panel" and furnished us with 115 replies. With very few exceptions the replies to Question 2 (*a-f*) were wholly or partly in the affirmative. Some of the replies expressed very strongly the writers' opinion that much sickness was due directly to want of teeth. The replies read as a whole leave no doubt in the reader's mind that a large amount of preventable illness among insured persons in Manchester is to be ascribed to neglected teeth.

MEDICAL OFFICERS OF HEALTH.

63. The evidence we obtained from approved societies and insurance committees was confirmed by that of the Medical Officers of Health who gave evidence before us. Dr. Robertson in particular stated:

"I do not think that anybody who has for their life's work the preservation of the health of the people generally can fail to be impressed with the large amount of harm that is done by defective dentition at the present time."

and in speaking of the masses of the people of Birmingham he added:

"In dealing with those masses, I have no hesitation in saying that neglect of teeth is everywhere evident. That is an opinion of which you cannot get very good evidence, but I feel very strongly all the same that real damage to health is done by the conditions one finds in the masses. Life is shortened and probably minor ailments are produced and these induce other diseases; so that although you do not get a man dying from something wrong with his teeth, you get him dying from tuberculosis or pneumonia or bronchitis, or anything else at an earlier age than he otherwise would have died at, by reason of the fact of the defective condition of his teeth. It is a debilitating condition."

64. Dr. Robertson further informed us that the Birmingham City Council had appointed a dentist in connection with the tuberculosis work organised by the Council, as it had been found that many tuberculosis cases have bad teeth—more so than the average population—and he regarded the defective teeth of young adults as one of the debilitating causes which induced tuberculosis. He regarded it as quite likely that the tubercle bacilli gained access to the throat through defective teeth, and it was only by having the teeth attended to that the real benefit from sanatorium treatment became available. As regards the relationship existing between bad teeth and various forms of intestinal sepsis and internal disorders, which were becoming more prevalent in Birmingham, Dr. Robertson was of opinion that these diseases

“Are unduly prevalent. I am sorry to say that colitis, appendicitis, duodenal ulcer, and various things like that (of which we do not know the causes at the present time, but may be due to defective teeth, and possibly are, and I believe are due to defective teeth) are really becoming more prevalent; they are not only becoming better known, but more prevalent.”

BOARD OF EDUCATION.

65. Sir George Newman, K.C.B., the Chief Medical Officer of the Board of Education, in a memorandum to the Committee refers to the results of dental decay in children in the following terms:

“The gravamen of dental defect is its secondary result. Dental sepsis is associated with four effects—(i) tooth caries, (ii) periodontal inflammation (pyorrhœa), (iii) conditions due to dead teeth or irregularities or abnormalities of denture, (iv) the collection of tartar and muco-purulent matter in the denture. Obviously, these conditions vary widely in degree and prevalence. Here, too, the gravity of the condition is its secondary result, the absorption of toxine and so forth.

The principal secondary results of dental disease in children, often appearing subsequently, are as follows:

- (a) The inflammation, pyorrhœa, and ulceration of the gums, leading to diseased conditions of the mouth and to glandular infection. Many medical and dental authorities hold that even tuberculous infection may be established in this way.
- (b) General malaise of the child, tiredness, lassitude, depression—in fact, a toxic neurasthenia.
- (c) A group of microbic intoxications which in some cases lead to joint affections simulating rheumatism in its symptoms.
- (d) Various forms of anæmia.
- (e) There are a group of somewhat mysterious and remote results of dental disease which leave their mark on the skin (acne, urticaria, eczema, etc.) affect the eyes (recurring iritis) or ears and dispose to nervous disorders.
- (f) There is a large group of alimentary toxæmia or gastro-intestinal conditions traceable to continued dental sepsis.

Further it must not be forgotten that many cases of adolescent and adult mal-nutrition or dyspepsia are due to loss of teeth in childhood.”

MISCELLANEOUS.

66. The evidence we received from medical sources, or derived indirectly from medical sources, was strongly confirmed by Mr. W. C. Anderson, M.P. Referring to the present inadequate school dental treatment, he stated that this neglect in childhood especially has cumulative results. It led to mal-nutrition and to great loss to the individual and the community. He was informed that many of the

approved societies were quite convinced that the drain on their funds would be diminished very much if there was adequate dental treatment for adults. He very strongly represented to us that if the nation spent its money in providing dental treatment it would be an economical investment. In Mr. Anderson's words:

"The nation would get it back in respect to good health, better workmanship, better work, less sickness and so on, all of which surely are vital to the nation."

67. In a memorandum we have received from the Army Council as to the condition of the teeth of recruits joining the army, the following extract from the report from the Southern Command indicates the close relationship of general illness with dental defect:

"The loss of man power to the State owing to defective dentition can best be gauged from a comparison of medical and surgical cases in hospital. It will be noticed that men returning sick show 25.4 carious teeth, as compared with 6.4 only of wounded, and 4 sound teeth only as compared with 17.6. Of the 304 medical cases examined, 160 are according to the Medical Officers, suffering from troubles directly attributable to defective teeth, *e.g.*, gastritis and indigestion, and from 60-70 from troubles indirectly so attributable; *e.g.*, rheumatoid arthritis, rheumatism, etc.

It is noteworthy that more than 50 per cent. of the medical cases were suffering from sickness of a kind directly or indirectly attributed to defective teeth. This percentage is in agreement with some of the evidence submitted by approved societies.

(b) THE CONDITION OF THE TEETH OF DIFFERENT AGE GROUPS OF THE POPULATION AS REGARDS DENTAL DECAY.

The evidence before the Committee as to the condition of the teeth of the masses of the people presents a picture of almost hopeless neglect, except in so far as it is relieved by dental work aided by grants from the Board of Education and the Local Government Board.

68. The Chief Medical Officer of the Board of Education, in a memorandum submitted to the Committee, estimates that out of 6,000,000 children on the registers of Elementary Schools in England and Wales not less than half, or 3,000,000, are in need of dental treatment, and not less than 500,000 urgently so. In many areas recent figures have shown that as many as 80 per cent. of children aged 6-8 years require treatment. In some areas it is over 90 per cent., as in the West Riding of Yorkshire. In London, 81 per cent. require treatment.

69. Dr. Robertson informed us that the artisan population of Birmingham really paid no attention whatever to their teeth; the numbers who have defective teeth being very large indeed. Some of the girls from the point of view of appearance sometimes have their teeth attended to, but so far as the men were concerned he regarded the conditions as "very dreadful." Dr. Lewis Graham, the School Medical Officer of Birmingham, stated that 95 per cent. of the school children of Birmingham required some treatment of their teeth.

70. Dr. J. D. Jenkins, Medical Officer of Health and School Medical Officer of Rhondda, informed us that out of 45,000 school children medically examined not more than two or three have been noticed to have had any dental fillings, although the condition of the teeth is a subject at every routine examination. He estimated that 24,000 school children were in need of dental treatment in the Rhondda schools.

71. Dr. Wheatley, Medical Officer of Health and School Medical Officer for Shropshire, submitted figures indicating that about 95 per cent. of children aged

5 years attending elementary schools in the area under his control had been found to have one or more decayed teeth. The average number of decayed teeth in children at this age was 6.6. The examination had been made without probe or mirror. The corresponding figures for children aged 12 were over 96 per cent., and an average of 4.7 decayed teeth. He estimated that the 40,000 school children had amongst them 160,000 to 220,000 decayed teeth, and that only the "merest fraction have had treatment." Dr. Wheatley referred to the conditions of the teeth of women examined for county council nursing scholarships. These women he regarded as representing the better working-class population of the county, they numbered 77, and the ages varied from 20 to 40, the average age being 27 years. The average number of teeth lost or decayed was no less than 18.

72. Dr. Barwise, Medical Officer of Health and School Medical Officer for Derbyshire, commented on the deficient dentition of patients in the County Sanatorium for Tuberculosis. He estimated that three-fourths of the male and female patients were in need of dentures, and that the female patients had each on the average 11 extractions.

73. The evidence submitted to the Committee indicated that the condition of the teeth of the women of the nation was worse than that of the men. Having regard to the direct connection between defective dentition and ill-health a greater amount of sickness would naturally be expected in respect of women than of men. The results revealed by the working of the National Insurance Act are in accordance with this expectation.

74. The Committee are in a position to estimate with a considerable amount of exactitude the condition of the teeth of the adult male population. The letter given below was sent to the Secretary of the Army Council, and the Committee have been furnished with a memorandum containing reports by the advisory dental officers of the various commands, which includes information regarding the dental condition of men on joining the Army. The memorandums also contained valuable information on other points which is referred to elsewhere:

The Secretary,
Army Council.

23rd March, 1918.

Sir,

I am directed by the Dentists Act Committee to enclose for the information of the Army Council a copy of the terms of reference to the Committee.

The Committee in order to be able to report usefully upon their reference have found it necessary to obtain information to enable them to form an opinion as to the general condition of the teeth of different age groups of the population. Evidence has been submitted to the Committee that much preventable sickness and invalidity is to be ascribed to neglected teeth.

The Committee have also been furnished with a considerable amount of evidence which tends to the conclusion that in the immediate future an increasing demand will arise for skilled dentists. Public dental services under maternity and child welfare schemes, school dental services and treatment under the National Insurance Act will all tend to increase. The extent and nature of the service required from dentists will, however, be largely conditioned by the condition of the teeth of the existing population.

The Committee understand that under the Military Service Act, and previously by voluntary enlistment, a very large proportion of the adult male population between certain ages have come under the review of the Army Medical Authorities.

The Committee have had great hesitation in asking the Army Council for information in the present stress of circumstances but it is hoped that the Army Council already possess information as to the dental state of recruits which could be made available to the Committee without trouble. In these

circumstances the Committee would be much obliged if they may be furnished with a short memorandum giving any available information on this matter, and expressing any views which may have been formed by the Army Council as to the invalidity caused in the Army and the charges falling on Army funds owing to defective dentition of soldiers.

I am also directed to state that the Committee would welcome an expression of opinion by the Army Council as to the importance to be attached from a military point of view to any general improvement that can be effected in the condition of teeth of the adult male population.

The Chairman and Secretary of the Committee will be very pleased to confer with any officer of the Army Council further on the matter if this should be considered desirable.

I am, &c.,

F. H. O. JERRAM,

Secretary.

75. The following are extracts from the memorandum:

SCOTTISH COMMAND.

In view of the fact that since 25th February, 1915, Recruits who are otherwise physically fit are not rejected on account of their teeth, the dental condition of men joining the Army is practically the same as that of men in the same classes in Civil Life.

(a) Young men 18 to 25 years usually require to have some hopelessly decayed and septic teeth extracted. In some cases extensive extractions and the provision of dentures is indicated, the proportion of such varies very much with the domicile and social status of the recruit. Fillings required are numerous.

(b) Men from 25 to 35 years. Generally some loose and decayed teeth to be extracted, arrested decay is common. Fillings not required in same proportion as in young men. Mouths frequently septic and very dirty. Proportion of men requiring dentures much larger than in (a).

(c) Men from 35 to 45 years, usually fall into two classes:

1. Those with sufficient teeth left for mastication, and
2. Those who require dentures.

(d) A number of men on joining are in possession of dentures, the majority in (b) and (c), many are satisfactory but a considerable proportion require their dentures remodelled to make them dentally fit.

* * * * *

Recruits from industrial areas and of the artizan or labouring class shew little or no evidence of having had any attention paid to their teeth previous to enlistment, and almost every man requires dental treatment.

Recruits drawn from offices, banks, professional and commercial pursuits frequently shew evidence of having had attention paid to their teeth previous to enlistment, and, consequently require much less dental treatment.

Men from the Dominions and Colonies are usually much better in respect of Dental health and efficiency than Home Troops.

In this command it was estimated that 44 per cent. of the men are dentally unfit in a military sense, *i.e.*, they lack the minimum of dental efficiency which will ensure effective mastication of food.

ALDERSHOT COMMAND.

Out of 35,645 men recently examined it was found that:

- 27.8 per cent. had teeth in good condition;
- 61.3 per cent. required conservative treatment and scaling;
- 10.9 per cent. required extensive treatment and dentures.

The amount and nature of dental treatment required by the above was as follows:

37,483 Extractions.

42,974 Fillings, many of which required root treatment.

4,985 Dentures.

Out of 8,500 young soldiers, not yet 19 years of age, examined, over 7,000 required extractions and conservative treatment.

LONDON COMMAND.

The dental condition of recruits on joining is generally bad, about 70 per cent. requiring dental treatment. These may be sub-divided into three classes:

- (a) Requiring slight treatment (2 or 3 fillings or extractions which can be completed at one visit), 22 per cent.
- (b) Requiring extensive treatment (extending over several visits, but not necessitating the provisions of artificial dentures), 40 per cent.
- (c) Requiring more extensive treatment (involving multiple extractions and the subsequent provisions of dentures which necessitates treatment extending over a month or more), 38 per cent.

WESTERN COMMAND.

It is considered that of men joining the Army during the year April, 1917, to March, 1918, between 70 and 80 per cent. were in need of dental treatment.

It was found in this command that of recruits between 18 and 19 years of age 83 per cent. required dental treatment, whereas of recruits aged 19 to 44 years 93 per cent. required dental treatment.

IRISH COMMAND.

The dental condition of men on joining the Army is very unsatisfactory, at least fifty per cent. of recruits requiring dental treatment.

SOUTHERN COMMAND.

The most noticeable feature in examining men's mouths is that dental treatment previous to joining the Army, with the exception of extractions, is practically unknown. With reference to young soldiers, the teeth on the whole are very good, extraction of the first permanent molars, if not already performed, will generally leave a fit clean mouth.

The number of sound teeth include in most cases the upper and lower front teeth, and leave very few for mastication, and one can say that all men with less than 15 sound teeth should in civil life, have at least one artificial denture, and men with less than 10, two dentures.

Of the teeth marked "Carious," about 50 per cent. only could be filled, the remainder are stumps or so septic as to be unserviceable.

EASTERN COMMAND.

The dental condition can only be described as "bad." Not more than 3 per cent. have a "perfect mouth" and 97 per cent. exhibit dental defects of varying degree.

Of this 97 per cent. it may be said that 75 per cent. are in urgent need of dental treatment, the remainder (which would include men who had availed themselves of some sort of dental treatment before enlistment) shew deficiencies in the number of teeth present but are more or less free from "active caries" and "sepsis."

It has become quite apparent that between the ages of 18 and 25 dental caries is very active.

From the ages of 30 upwards the more or less chronic condition is reached—there is a slowing down of the process of active caries—"dead teeth" and "stumps" accompanied by oral sepsis are prevalent in varying degree and "empty" mouths through periodical extractions for the relief of pain, etc., become increasingly common.

NORTHERN COMMAND.

The general condition of the teeth of men joining the Army is deplorably bad. With the exception of men recruited from the upper, and to a certain extent, the middle classes—and, it might be added, members of the Colonial Forces—there is almost an entire absence of appreciation of the importance of clean mouths and care of the teeth. The percentage of men who shew evidence of a daily use of the tooth brush is very small, numbers frankly stating that they have never used a tooth brush in their lives; and the proportion presenting with active and wholly neglected dental caries is extremely high. There is a marked want of appreciation of the importance to health of maintaining an efficient masticatory apparatus by conservative treatment of carious teeth. With the exception of the classes above referred to, there is almost an entire absence of previous dental treatment, other than the extraction of teeth for the relief of pain, or of decayed front teeth to be followed by dentures for æsthetic reasons. As would be expected, therefore, the condition of the teeth is found to be progressively worse in proportion to the age of the recruit.

It has been noted that men drawn from industrial centres present a worse dental condition than those from agricultural districts.

The benefits of dental treatment inaugurated by the Board of Education for school children is not yet appreciable in men recruited for service, doubtless owing to the fact that these School Dental Clinics have only comparatively recently come into existence and that attention was concentrated on the treatment of children between the ages of six and nine years.

The Inspector of Dental Service of the Northern Command directed a special inspection of 1,800 recruits with a view to classification of dental defect in age groups. The figures obtained were as follows:

	Age Groups.			
	18 and under.	19-24.	25-29.	30 and over.
Per cent. of men examined with all teeth sound	19·8	4·9	4·1	3·2
Per cent. of men examined with decayed teeth	64·0	84·0	83·2	80·7
Average No. of decayed teeth per man	4·5	7·3	6·9	6·5

* * * * *

From the point of view of Public Health, most of the men examined would require dental treatment. The percentages of those who could be considered as "dentally fit" from the Public Health standpoint, compared with those who, under the present Army standard (under which only the minimum of treatment which will enable a man to masticate, and under which of necessity, many teeth which are savable are allowed to become unsavable), were actually passed as "dentally fit"; and are shewn in the following Table:

Dentally fit.	18 and under.	19-24.	25-29.	30 and over.
	Per cent.	Per cent.	Per cent.	Per cent.
Public Health Standard	33·0	10·3	13·0	14·0
Army Standard	57·0	49·0	52·0	54·0

76. The memorandum affords valuable confirmatory evidence of the statements made to the Committee by witnesses as to the deplorable state of the teeth of the people.

Having regard to the large amount of preventable sickness and chronic invalidity terminating, in many instances, in premature death which results from the effect of oral sepsis and decayed teeth, the Committee view the facts which have been brought to their notice with the gravest concern. They are of opinion that the state of affairs revealed should receive early attention with a view to the improvement of the health of the nation and an increase in its industrial efficiency.

Section VI.—Shortage of Registered Dentists.

77. In considering whether there is any shortage of registered dentists and, if so, the extent of that shortage, the Committee have been greatly aided by the replies received, in response to a circular letter of enquiry from the Committee, from various bodies representative of the registered and unregistered practitioners and of the medical profession. The Committee have also received much valuable evidence from certain insurance committees and approved societies who replied to a questionnaire circulated by the Committee. The evidence of individuals, especially Mr. W. C. Anderson, M.P., Professor Sidney Webb, Dr. J. Robertson, the Medical Officer of Health of Birmingham, Dr. Lewis Graham, the temporary School Medical Officer to the Birmingham Education Committee, and Dr. Jenkins, the Medical Officer of Health and School Medical Officer of the Rhondda Urban District Council, has been most helpful. The Committee have no doubt that they are in possession of information which enables them to form a reliable opinion on this part of their Reference.

78. Sir Donald Macalister has furnished the Committee with statistics relating to the dental register, which includes the names of all persons entitled to describe themselves as dentists. At the time of its institution in 1879 the register contained 5,289 names, of which 4,006 were admitted in virtue of having been in practice before 1878. In the Dentists' Register for 1918 the figures are 5,524, of which 4,214 represent licentiates and other qualified persons, and 1,281 persons admitted by virtue of being in practice in 1878. During the intervening years the number of names added practically remained stationary, the number of new names added being just sufficient to make good the names removed. Sir Donald pointed out that this stagnation of the Dental Register has been accompanied with a considerable increase in the demand of the public for dental attention and the establishment of public dental services, such as the school dental service. He stated that doctors are more and more sending their patients to qualified dentists, as the medical profession have increasingly felt the importance of sound teeth.

79. The population of the United Kingdom has in the interval between 1878 and 1917 increased by 37 per cent. without any corresponding increase in the dental register. On the average one registered dentist in 1879 sufficed for a population of 6,500, whereas in 1916 the population served had risen to 8,500 per registered dentist. It has to be remembered, however, that following the institution of the 1879 register all the practitioners of dentistry, qualified or unqualified, were admitted to the register, and, therefore, that the register at that date was really a

register of nearly every person practising dentistry, and included the names of practitioners comparable with the unregistered practitioners of the present day. A present-day register to compare with that of 1879 should include the unregistered as well as the registered practitioner.

80. Mr. Norman Bennett, on behalf of the British Dental Association, emphasised in his evidence this difference in the qualifications of the individuals whose names appear in the 1918 register with those who were registered in 1879. The very large proportion of the persons whose names appear in the 1918 register are instructed and trained dentists, licentiates in dental surgery. The persons whose names appear in the 1879 register were not so trained.

81. The Incorporated Dental Society, and others, have, for comparative purposes, specially directed our attention to the growth in the number of names appearing on the Medical Register. The Society supplied us with the following comparative figures:

UNITED KINGDOM.

Year.	Population.	Number of names on Medical Register.	Number of names on Dental Register.	Number of Medical Practitioners per 1,000,000 popu.	Number of Dentists per 1,000,000 popu.
1879	34,156,113	22,600	5,289	661	155
1916	46,431,546	43,225	5,453	931	117
Increase or decrease do. do. (per cent.)	+12,275,433 36% (inc.)	+20,625 91% (inc.)	+164 3% (inc.)	+270 41% (inc.)	-38 25% (dec.)

The comparison is a useful one although in some respects the two professions are not strictly comparable. In dental practice the registered practitioner has in competition with him unregistered practitioners professing to treat patients in exactly the same way as he does, to supply the same quality of artificial teeth, and to perform the same operations. Unqualified medical practice does not run on such parallel lines, and is not in such direct competition with qualified medical practice.

82. The main fact brought out by the figures submitted to us is, however, that during the last 15 years the dentists' register has remained stagnant and there does not appear to be any likelihood under existing conditions of increase in the number of registered practitioners in the near future. That the present number of registered practitioners is insufficient for the needs of the population is made evident when the distribution of these practitioners throughout the United Kingdom is considered. As would be naturally expected with a deficient supply, the registered dentists are not uniformly distributed. Some portions of the Kingdom are much better supplied than others. Sir Bertram Windle, F.R.S., who appeared before us as one of the witnesses for the General Medical Council gave us some striking figures as regards Ireland in this connexion. In 1915 out of 249 registered dentists no fewer than 169 were in practice in Dublin, Belfast, and Cork, leaving only 80 dentists for the rest of Ireland. In the City of Dublin alone there were no fewer than 109 dentists, while in the County of Kerry there were only 2 registered dentists serving a population of about 160,000 persons. The paucity of registered dentists in Ireland as well as their very uneven distribution was also strongly represented to us by Mr. J. W. Carse, who gave evidence on behalf of the Dental Society of Ireland, a body of unregistered practitioners.

83. The British Dental Association has supplied us with valuable statistics, tabulated in various ways, to show the distribution of dentists in the towns and

counties of the several portions of the United Kingdom. The Incorporated Dental Society and the Dental Society of Ireland have also supplied us with statistics bearing on the distribution of dentists. We have had evidence submitted to us which indicates that statistics prepared from directories need much correction, and are not to be taken as necessarily indicating the actual position as regards the supply of dentists available for a particular district or town. In smaller towns it is a quite common practice for a dentist to attend from another district on certain days; some dentists have branches in several towns. In such cases one of two things is likely to happen. Either the dentist is only recorded as serving the town in which he resides, or else he is credited to each town he visits. In the one case the towns which he visits appear in the statistics as not served by a dentist, while in the other case the apparent number of dentists is in excess of the actual facts.

84. There are other reasons why the appearance of a name in a register or directory does not always connote actual practice in dentistry. The most direct evidence we have had in this connection was an enquiry into the number of dentists in Sheffield made in 1915, particulars of which were submitted to us by Mr. W. C. Anderson, M.P. Out of 54 dentists on the register in Sheffield, 16 were not in practice, 2 were fully occupied with school children, 3 were dead, 6 did little or no dentistry, and 3 were in the Army. A paper register of 54 resolved itself into an actual one of 24. The number of dentists actually attending to the needs of a town of 460,000 inhabitants, excluding the school children was in reality only 24 instead of 54. Mr. Anderson also stated, "There are large areas with big populations which are practically without the services of registered practitioners." A striking instance of such an area is the Rhondda Urban District in Glamorganshire. Dr. Jenkins, the Medical Officer of Health informed us that in the Rhondda Urban District, with a population of 160,000, there was only one registered dentist. It is to be observed that the population of this urban district is mainly composed of colliers who earn high wages, and should be able from a very early age, 17 or 18, to pay adequately for any attention which their teeth might require.

85. Dr. Robertson, the Medical Officer of Health of Birmingham, when expressing the opinion that there was certainly not an adequate supply of registered practitioners in Birmingham, stated that in Birmingham the registered dentists dealt mainly or largely with the middle and better class people. Dr. Wheatley, the Medical Officer of Health of Shropshire, mentioned that in that county, with a population of 240,000, there were only 14 registered dentists, and he estimates that conservative dentistry is only provided for about 10 per cent. of the population of the county. All the representatives of the unregistered practitioners who expressed views on this part of our reference were emphatic that the registered practitioners were unable to meet the existing requirements of the people, especially the needs of the working classes.

86. The memorandum as to "Shortage of Registered Dentists" sent to the Committee by the British Dental Association stated that viewed from the standpoint of public demand it would be difficult to prove that there was any serious shortage of registered dentists at the present time. Mr. Norman Bennett in evidence inclined to the view that the reason why the poorer classes are served by the unregistered dentist is that these classes are not yet accustomed to regard conservative dentistry as really essential to their health, and think of dentistry simply in terms of getting their teeth so bad that they have to be taken out and then having a denture. He did not ascribe the shortage of registered dentists in industrial districts to the relative expensiveness of conservative dentistry and to the inability of the working class to pay the fees charged for this class of work. We were particularly struck with a statement by Mr. Norman Bennett that it was

such towns as Cheltenham, Tunbridge Wells, Bournemouth and Eastbourne that were well supplied with dentists.

87. The most direct evidence we had against the view that there was a shortage of registered dentists was furnished by Mr. J. Towart, who gave evidence with Mr. George H. Watson on behalf of the Medical and Dental Defence Union of Scotland. For the purpose of preparing their evidence the Union had sent out a questionnaire to every registered dentist in Scotland. One of the questions to be answered was in the following terms: "Is there an inadequate supply of qualified dental surgeons in your district other than that produced by the shortage of mechanics owing to the war?" The replies received to this question were almost unanimously in the negative. In evidence, Mr. Towart explained that the position was that the registered dentists in Scotland were not fully employed, and could actually do a great deal more work with adequate mechanical assistance. He was not prepared to contend, nor did he suggest, that the registered dentists in Scotland could meet all the needs of the population if the unregistered practitioners ceased to practise.

88. The replies received by the British Medical Association to the questionnaire sent out to the divisions (*see* para. 44) elicited information which pointed to a great shortage of registered dentists in some districts. At Nuneaton, Bolton, Dudley, Huddersfield and Monmouthshire 90 per cent. or over of the population are said to consult unregistered dentists. The following particulars supplied by the Association indicate the acute shortage of registered dentists in many districts and the very uneven distribution of registered dentists in other districts:

Banff, Elgin and Nairn Counties: In many districts only unqualified practitioners.

Birmingham: Large suburban areas are without qualified men.

Bolton C.B. (pop. 168,000): 13 qualified to 80 unqualified men.

Colchester District (pop. 100,000): 4 qualified men.

Dartford U.D. (pop. 19,000): 4 qualified men, including two visiting.

E. Ham C.B. (pop. 133,000): No qualified men.

Glasgow South: Unqualified men in a great majority.

Halifax Division (pop. about 199,000): 10 qualified and about 25 unqualified men.

Huddersfield Division (pop. about 193,000): 7 qualified and over 100 unqualified men.

Ilford U.D. (pop. 78,000): No qualified men.

Northampton C.B. (pop. 87,000): 5 qualified and over 20 unqualified men.

N. Glam. Division (pop. 405,000): Only 5 qualified and 2 registered.

Rhondda U.D. with pop. of 114,000 (or, according to Hon. Secretary, 180,000): Has no qualified man.

Nuneaton U.D. (pop. 25,000): Two or three times as many qualified men could find work if there were no unqualified men.

Renfrew M.B. (pop. 10,000): 1 qualified man adequate while unqualified men allowed to practise.

Rochdale C.B. (pop. 83,000): 3 qualified and at least 20 unqualified men.

Romford U.D. (pop. 17,000): No qualified men.

Ryton U.D. (pop. 9,000): No resident qualified practitioner; two unqualified men.

S. Staffs. Division (pop. about 291,000): Only 5 registered dentists.

Stratford Division (pop. 574,000): 7 qualified men.

Trowbridge Division (pop. about 106,000): Only 4 qualified dentists, including school dentist. About 30 unqualified men, all of whom have large practices.

West Ham C.B. (pop. 289,000): 2 qualified dentists.

89. We have given the most careful consideration to all the evidence put before us bearing on the question of "shortage" of registered practitioners, and submit the following conclusions:

- (1) There was a great shortage of registered dentists before the war, which shortage has become intensified at the present time.
- (2) Registered practitioners are very unevenly distributed in the different countries of the United Kingdom, and also in the different parts of each country.
- (3) The registered practitioner mainly attends to the dental needs of the upper and middle classes, the artisan and working classes in the bulk receiving, in proportion to their numbers, very little treatment from the registered dentist.
- (4) The dental needs of the population do not determine where the registered dentist practises.
- (5) The registered dentist tends to gravitate to the centres of populous towns and to smaller towns where high fees are obtainable or a lucrative practice probable.

Stated briefly, owing to the shortage of dentists registered dentists practise in localities which are determined more by the social status of the inhabitants and the fees which it is possible to earn than by the need of the people for dental treatment.

Section VII.—Causes of the Shortage in Numbers of Registered Dentists and Suggested Remedies.

90. We are agreed that there is a great shortage of registered dentists, and we have received a considerable amount of evidence as to the causes which have operated to produce this shortage. The evidence received from registered dentists is practically unanimous that the main reason why sufficient students do not enter the dental profession is owing to the unsatisfactory state of the law. Parents will not choose a profession for their sons which is liable to confusion with, and competition by, unqualified practitioners who have received neither instruction nor training in dentistry. It is further represented that the unregistered practitioner is frequently a charlatan attracting business with blatant advertising or unscrupulous touting, who being subject to no control or professional code of ethics, brings discredit on the dental profession. As the public is unable to distinguish the professional dentist from the unregistered practitioner the whole status of the dental profession and its individual members is lowered and debased.

91. We think that the representations that have been made to us are not one whit too strong, and that the registered dentist feels most keenly the unfortunate social position of his profession. We do not think that the registered dentist is unable to make a satisfactory living at his profession, nor has this been suggested to us. On the contrary, owing to the shortage in dentists he is enabled to pick and choose the locality in which to practise. It has been put before the Committee very strongly by the General Medical Council, the British Dental Association, and representatives of other bodies competent to express the views of registered dentists, that the prohibition of dental practice by unregistered practitioners will of itself lead to such an increase in the number of dental students entering the dental schools that in a few years the number of registered dentists will fully meet the dental needs of the public. The length of the dental curriculum, the stringency of the examinations (educational and professional), and the expense of training were usually regarded as affecting only in a minor degree the number of students seeking to enter the dental profession.

92. The unregistered practitioners, while agreeing that the state of the law in permitting unregistered dental practice naturally has led to a less number of practitioners seeking to qualify for registration, have coupled with this other reasons which have contributed to the shortage. Thus the Incorporated Dental Society in a statement to the Committee narrate the following reasons as operating in producing a shortage in registered practitioners:

(1) The heavy expense and the length of time involved in qualifying for the requisite diploma to obtain admission to the Dentists' Register, which deter any but the well-to-do from entering the profession of dentistry through the recognised portals.

(2) That the period of training and the pecuniary outlay is only a little, if any, less than that required to qualify for medicine and surgery, whereas the medical profession offers better pecuniary prospects than the dental profession.

(3) That dentistry, unlike other professions, involves laborious work in the considerable section of mechanics and is thereby less attractive than other professions.

(4) That rightly or wrongly dentistry has been considered by the well-to-do as a profession lower in the social scale than the practice of medicine.

(5) That the registered dentist, being subject to the control of the General Medical Council and to a certain code of ethics and in effect precluded from advertising his practice to any great extent, finds himself at a disadvantage compared with his unregistered opponent.

(6) The ignorance of parents as to the qualifications required for admission to the Dentists Register and the frequent failure of dentists when taking premium apprentices to explain to parents the time and expense involved in going through the necessary curriculum to obtain admission to the Dentists' Register, the result being that upon the conclusion of the apprenticeship the individual starts as an assistant with a view to perfecting his knowledge and ultimately starting practice for himself as an unregistered practitioner.

(7) The fact that, more especially in the provinces, registered dentists frequently employ unregistered assistants to do not merely mechanical work, but operative dentistry, and have entire charge of visiting branches without any supervision. The result is that these men having gained experience in that matter seek to improve their pecuniary and social position by starting in practice for themselves and so the number of unregistered practitioners is increased.

(8) A number of persons, including registered dentists, have advertised in various trade journals pointing out the advantages to be gained by the practice of dentistry either separately or in conjunction with pharmacy and offering "to teach the art of dentistry and fit persons for the practice of dentistry in a week," thereby causing an influx of unregistered practitioners with little or no knowledge or experience. It is such men who are largely responsible for such evils as exist.

(9) Many unregistered practitioners who desire their sons to follow the calling of dentistry would have been quite willing and, indeed, would have preferred that they should become registered dentists. Dental schools or examining bodies, however, refuse to recognise the indentures of an unregistered practitioner—consequently an unregistered practitioner, instead of training his son in mechanical dentistry, would be compelled to send him to a dental hospital for training in mechanical dentistry which he would in some cases receive, not from a registered, but an unregistered man. These young men, therefore, have started as unregistered practitioners instead of as registered dentists.

93. The first three reasons would not be removed if the law were altered so as to prohibit the practice of dentistry by unregistered practitioners. The reasons 5-9

would cease to operate if the law was so altered. Before expressing the conclusions which have been reached by the Committee we would wish to refer to evidence which Mr. Sidney Webb gave that bears on this question. He represented to us that as long as the class from which dental students were drawn was limited to those whose parents could afford to spend £1,000 in training a son for a profession, the number of students who could enter such a profession was strictly limited, and it was hopeless to expect that sufficient students would be forthcoming adequately to fill the ranks of a profession largely increased in numbers. He advocated a system of State scholarships on a generous scale to make good the deficiency of dental students, and so ensure a sufficiency of dentists to meet the needs of the public.

94. We are of opinion that sufficient registered dentists are not likely to be obtained to meet the dental needs of the population in the future unless the present state of the law is altered and the dental profession is protected against competition by unregistered practitioners. Unless effective steps to this end are taken we are of opinion that the number of registered dentists entering the profession is only likely to suffice for the services of the rich and comparatively well-to-do. The working classes will have to rely on the unregistered practitioner, and will continue to be liable to suffer all the evils associated with his class of practice. While we regard the protection of the dental profession, as stated in this paragraph, as fundamental, we attach importance to the reasons advanced by the Incorporated Dental Society, believing that the unregistered practitioner is likely to have a very clear impression of the reasons which have prevented him personally from becoming a registered dentist, and that possibly his opinion in this respect may be more correct than that of the registered dentist. For this, among other reasons, we think that the expense and length of time involved in qualifying for a registrable diploma are factors which cannot be disregarded as contributing to the shortage of dentists.

95. As regards expense to students, this can be lessened by shortening the length of the curriculum, increasing the State grants available for dental schools so as to secure a diminution of fees charged to students, and by a liberal provision of scholarships. We are in favour of all three methods under certain conditions, which are specified elsewhere in the report. (Paras. 156, 216-20, 225.)

Section VIII.—Dental Treatment assisted by the Local Government Board.

96. The attention of the Committee has been called to two directions in which dental advice and treatment are provided by local authorities with the assistance of State grants administered by the Local Government Board. Sir Arthur News-holme, K.C.B., the Medical Officer of the Board, has furnished the Committee with a memorandum on the subject.

I. DENTAL TREATMENT IN RELATION TO MATERNITY AND CHILD WELFARE WORK.

97. Under the regulations of the Local Government Board as to Maternity and Child Welfare grants are available for approved expenditure on a dental clinic for expectant and nursing mothers, and for children under 5 years of age. The grant is available for the payment of the dentist and the equipment and maintenance of the clinic. The grant is also available for the provision of new dentures in cases where the medical officer of a maternity centre is satisfied that such provision will materially conduce to the improvement of the health of the expectant or nursing mother and the mother is not able to provide dentures herself.

The grant for dental treatment has only been available for a very short period,

but already much progress has been achieved, and Sir Arthur Newsholme in his memorandum mentions 10 metropolitan boroughs and 10 provincial areas in which dental schemes are in operation or in process of being established.

98. The Committee regards the extension to dental treatment of the grants for aiding maternity and child welfare as meeting a great public need. Expectant and nursing mothers should, perhaps more than any other section of the community, have teeth in such a condition that they can properly masticate their food. To this end their teeth ought to receive such dental treatment as is needed, and where necessary deficient dentition should be made good by the provision of artificial dentures. Such treatment is necessary in the interest both of the mother and her child. The institution of dental treatment in association with child welfare centres is particularly valuable as affording a means of bringing the teeth of young children under observation and, if necessary, obtaining treatment before the child attends school. There is evidence that the advantages accruing from school dental inspection and treatment would be greater if the children came under dental treatment before school age.

99. The advantage of children coming under dental supervision before school age has been forced on the attention of school medical officers and dental officers by the extent of decay which has been found to exist at the first medical inspection of children after entering school. Individual school medical officers have supplied us with figures for the districts for which they act, and figures for grouped areas are included in Sir G. Newman's reports. In 1916 he states that in a survey of 42 areas of all kinds, comprising counties and county boroughs, the routine medical inspection of "entrants" showed 66.7 per cent. having dental defects. Dental defect at entrance to school life is mainly in the temporary teeth, but unfortunately frequently a considerable amount of dental decay has also taken place in such permanent teeth as have erupted. There is a consensus of opinion that the prevention of decay in temporary teeth would save many cases of decay subsequently setting in in the permanent teeth, especially in the first permanent molars. Dr. Hamer, the medical officer of health and school medical officer of the London County Council, in his annual report for 1917 states that the percentage of entrants with "severe caries or oral sepsis" was, during 1917, over 23 per cent. He mentions that arrangements have been made at some of the Council's dental centres for treatment to be available in connection with infant welfare centres, for expectant and nursing mothers.

The Committee are of opinion that dental treatment of expectant and nursing mothers and of children under five years of age in connection with maternity and child welfare schemes should be energetically pressed forward as a branch of practical preventive medicine. The Committee indeed look forward to maternity and child welfare centres being regarded in the course of a few years as fully efficient and eligible for full government grants only if dental treatment is provided.

II. DENTAL TREATMENT FOR TUBERCULOSIS.

100. The Local Government Board hold that county and county borough councils may properly provide for persons suffering from tuberculosis such dental treatment as is necessary to assist the patients' recovery from the disease. This treatment comprises conservative treatment and the extraction of teeth. The government grant of 50 per cent. of the net expenditure of councils on the treatment of tuberculous persons, insured and non-insured, is available in aid of expenditure incurred by a council with the approval of the Board on the dental treatment of such persons, and also on the provision of artificial dentures when these are a material aid to the patient's recovery and he cannot afford to pay for them himself. Sir Arthur Newsholme's memorandum gives 34 instances in which councils have

made arrangements, or propose to make arrangements, for providing dental treatment for persons suffering from tuberculosis.

101. Expenditure on dental treatment for tuberculous patients is often imperative in the interests of the patient, but the Committee observe that this is expenditure which when adequate dental treatment of children and young adults is provided, should in the course of time very greatly diminish. It furnishes an excellent example of how the neglect of the State to provide a preventive dental service for its young citizens leads later on to the State needing to intervene to give its adult citizens an improved prospect of recovery from a fatal disease. Tuberculosis is a disease, moreover, which many competent authorities regard as favoured by the conditions resulting from neglect of dental disease.

Section IX.—School Dental Inspection and Treatment.

PIONEER WORK.

102. The importance of the inspection and treatment of the teeth of school children was first seriously brought before the dental profession and the public both at home and abroad by a series of papers and reports which were presented at the annual meetings of the British Dental Association by Mr. W. MacPherson Fisher, of Dundee, from 1885 to 1889. In his first paper, in 1885, Mr. Fisher expressed the opinion "That every child's mouth ought to be examined and treated on its entrance into school life . . . and at least once a year, or oftener by a qualified dentist." The British Dental Association, on March 1st, 1890, appointed a committee "to continue and to conduct the collective investigation as to the teeth of school children, and to finally report thereon to the Representative Board." The committee issued a series of seven annual reports from 1891 to 1897.

103. About the same time the first public appointments of school dentists were made by the boards of guardians to inspect and treat the teeth of children in poor-law schools. The Local Government Board, in 1897, issued a series of recommendations to boards of guardians in regard to the appointment of dental officers as follows:

1. The officer appointed should be required:

To attend at the school or other appointed place according to his agreement with the guardians or managers.

To inspect the teeth of all children admitted since his last visit.

From time to time, according to his agreement, to inspect the teeth of all the children in the school or workhouse, as the case may be.

To attend duly and punctually at each visit upon each child requiring dental treatment, and upon any child who may be brought to him for treatment in the intervals of such visits.

To keep a record of his work, and to report the same to the guardians or managers, in a book to be provided by them for the purpose, under the following heads:

Date.

Number of children inspected.

" temporary teeth extracted.

" permanent teeth extracted.

" teeth filled.

" scalings.

" other operations performed.

Any matters which the dental officer may deem necessary or desirable to bring to the notice of the guardians.

This book should ordinarily be kept at the school or workhouse, and should be laid before the guardians or managers by the clerk at each meeting, and

should be produced to the inspectors of the Local Government Board when required.

2. It was required that the dental officer should be duly registered in accordance with the Statutes in that behalf (41 & 42 Vict., c. 33, 1878, and 49 & 50 Vict., c. 48, 1886), or if not so registered, by reason of any medical or surgical qualification exempting him from the obligation of registration as a dentist, the officer appointed shall produce satisfactory evidence that he held a license in dental surgery from the Royal College of Surgeons of England, Edinburgh, or Ireland, or from The Faculty of Physicians and Surgeons of Glasgow, or other approved authority.

3. The guardians or managers were allowed to pay a dental officer either by an inclusive salary, or partly by salary, and partly by fees on a fixed scale for specified operations, provided that all payments for extractions shall be included in the salary assigned to the officer and shall not be made by fee.

4. If the dental officer attends at the school or workhouse, it would be necessary that the guardians or managers should provide for his use a suitably equipped surgery, including a dental chair and a dental engine, and such other apparatus as may be necessary. It is desirable that they should also provide the necessary materials for fillings, and such special appliances as may be needed for mechanical treatment.

104. It will be noticed that these recommendations provided for:

- (1) The appointment of registered dentists or licentiates in dental surgery.
- (2) The inspection of newly admitted children.
- (3) The periodical inspection of all children.
- (4) The dental treatment of children requiring it at the periodical inspections.
- (5) The treatment of special cases brought to the dentist between periodical inspections.
- (6) The keeping and inspection of records of work done.
- (7) Provision of suitable equipment and materials.
- (8) Payment either wholly by salary or partly by salary and partly by fees for specified operations.
- (9) Payment for all extractions was to be included in the salary and not be the subject of special fees.

These recommendations were designed to secure a complete periodical inspection and conservative treatment of the teeth of children in poor-law schools under the control of boards of guardians. A number of dentists have been appointed, and dental clinics established in London and the provinces.

105. A number of dental appointments have also been made with the sanction of the Secretary of State and the Secretary for Scotland in connection with reformatory and industrial schools.

106. The appointment of school dentists led to the formation, in 1898, of the School Dentists' Society, composed of dentists appointed to any public institution for children. The first president was Mr. Sidney Spokes, who gave evidence before the Committee in another capacity. The present president, Mr. R. Denison Pedley, F.R.C.S., Edin., L.D.S., gave evidence before us on behalf of the society.

107. The dental inspection of school children became merged, in the first decade of the present century, into the major question of medical inspection of school children, of which it naturally forms a part. In 1903 appeared the report of the Royal Commission on Physical Training (Scotland), in 1904 the report of the Inter-Departmental Committee on Physical Deterioration, in 1905 the report of the Inter-Departmental Committee on Medical Inspection and Feeding of Children attending Public Elementary Schools.

108. These several reports directed public attention to the importance of school medical inspection and treatment. In 1907 was passed the Education (Administra-

tive Provisions) Act, 1907. Section 13 I (b) imposed a duty upon each local education authority "to provide for the medical inspection of children immediately before, or at the time of, or as soon as possible after their admission to a public elementary school, and on such other occasion as the Board of Education direct, and the power to make such arrangements as may be sanctioned by the Board of Education for attending to the health and physical condition of the children educated in public elementary schools." It will be noticed that whereas the medical (including dental) inspection of elementary school children was imposed as a duty, the medical treatment of any diseased conditions of children (including diseased teeth) which the medical inspection revealed was not made a duty, but an enabling power which local education authorities might exercise under certain conditions.

109. The passing of the Education (Administrative Provisions) Act, 1907, marked the introduction of a new era in the medical examination and treatment of the school child. Under the duties and powers imposed and conferred the dental examination and treatment of school children has been gradually developed as a branch of the school medical service.

THE DENTAL INSPECTION AND TREATMENT OF THE ELEMENTARY SCHOOL CHILD.

110. The gradual development of school dental inspection and treatment is recorded in the annual reports of the Chief Medical Officer of the Board of Education, who has invariably included a separate section dealing with dental inspection and treatment.

In the first memorandum issued on Section 13 of the Act,* the Board of Education laid it down that as far as practicable the statutory medical inspection should, at entrance or at subsequent inspection, take account of the teeth and of oral sepsis.

In a circular (No. 582) issued in January, 1908, on the subject of a schedule for medical inspection the Board of Education expressed the view that the minimum of efficient medical inspection to be made and scheduled should include, so far as the teeth were concerned, a statement as to the general condition and cleanliness of temporary and permanent teeth and amount of decay. Exceptional features such as Hutchinsonian teeth were to be noted, as also was oral sepsis.

111. A mass of comparative data has been received in the Medical Department of the Board of Education as to the state of the teeth of different age-groups of school children in the several parts of England and Wales, and tables giving summarised information on these points are included in the annual reports of the Chief Medical Officer of the Board. As early as 1909 Sir George Newman recorded that 20 to 40 per cent. of the six million children in the public elementary schools of England and Wales suffer from extensive and injurious decay of the teeth, and that the vast majority of children of school age suffer from dental disease in some degree. It was realised that it was quite impracticable for local education authorities, even if they had been willing, to attempt to treat this mass of diseased teeth. Under guidance of the Board of Education treatment has in the first instance been directed to the early permanent dentition and particularly to the first permanent molars.

112. The age group 6 to 8 years has formed the chief point of attack. Preventive and conservative treatment at this age with subsequent periodical inspection and supplementary treatment of children previously dealt with has been strongly advised. The first few years were largely experimental as to the best administrative methods to be employed for dental treatment. The following methods have been adopted:

* Circular 576. Memorandum on Medical Inspection of Children in Public Elementary Schools under Section 13 of the Education (Administrative Provisions) Act, 1907 (22 Nov. 1907).

- (a) Private dental practitioners—in association or otherwise—working in special clinics under contract with the authority.
- (b) Dental hospitals.
- (c) School dental clinics conducted by whole or part-time dentists.
- (d) Itinerant dentists in country areas with or without dental caravans.

113. Associated with dental inspection and treatment, schemes of educational work have been carried on among the parents and by the teachers in the schools. This educational work has been partly directed towards oral cleanliness and the cleansing of children's teeth, beginning with the infants' schools, and partly concerned with the causes of dental caries. Sir George Newman states that the unsuitable feeding of children from one to five years of age is one of the chief causes of dental caries. He prefaced the section on dental disease and dental treatment in his annual report for 1912 with the following paragraph:

"It is no longer necessary to emphasise either the serious extent of dental caries among school children or the evil effects, direct or indirect, of such disease upon the general health. The reports received from all areas tell the same tale as in previous years—a tale of disease and of far-reaching injurious effects—and in localities in which no organised attempt has been made to deal with the problem it is evident that school medical officers, not unnaturally, are beginning to feel the comparative futility of reporting year by year on the same unsatisfactory conditions with their grave results. Nevertheless, appreciable advance has been made in dental treatment during the year under review and, difficult in many respects though the problem undoubtedly is, the experience already gained has shown that the question of the general methods to be adopted in combating dental disease must be considered to have passed out of the experimental stage."

114. In stating the result of his experience Sir George Newman added that the appointment of a dentist or dentists on the staff of the school medical officer was now generally recognised as necessary, and that the appointment of such officers served as a stimulus to the educational work which had been set in motion by medical inspection. He advocated strongly the undertaking of a scheme of conservative dentistry on a preventive basis and comprising the following:

- (i) The practice of cleanliness of the mouth by the proper use of the tooth-brush or otherwise at least every night and morning.
- (ii) The detection of dental disease at the earliest age possible by appropriate dental inspection.
- (iii) The arrest of such disease by its prompt treatment, in order to prevent further extension. Such treatment is generally a "stopping" or "filling" of the tooth, but extraction is not necessarily precluded from the practice of conservative dentistry.
- (iv) The re-examination and "following-up" of the case at suitable intervals in order to maintain a healthy set of teeth.

He adds:

"An Authority which deals with disease in this way will have the satisfaction of treating not only the maximum number of children but of ensuring that in a comparatively few years the ravages of dental disease, as known to-day, will no longer exist."

115. The basis of a satisfactory scheme of school dental inspection and treatment should have regard to the following considerations, which are extracted from Sir George Newman's Annual Report for 1916:

- (1) The arrangements, including the keeping of records, should be under the control and supervision of the School Medical Officer, on whose staff the dentist undertaking the work should be formally appointed.

(2) Dental inspection should be carried out by a qualified dentist, preferably by the dentist undertaking the treatment. In exceptional circumstances the Board are prepared, in the case of rural areas, to consider proposals for the School Medical Officer or Assistant School Medical Officer to undertake dental inspection, provided that it can be shown that they are conversant with the indications pointing to the need for conservative dental treatment, and are competent to perform:

- (a) adequate dental examination with probe and mirror;
- (b) proper dental recording.

Dental inspection should, as a rule, take place on the school premises and in school hours. It is not advisable that children should be sent to the private houses or surgeries of dentists.

(3) Attention should be concentrated in the first instance on the group of children from 6-8 years of age. Some dentists prefer to begin with five-year-old children. The "critical age" is, of course, the time of the emergence of the permanent teeth.

(4) An accurate record should be kept of each mouth examined and of the treatment carried out.

(5) The treatment should be conservative in character, and accordingly the bulk of the treatment work should be by filling rather than by extraction. Conservative dentistry includes also preventive measures, such extraction work as contributes to the preservation of the dentition as a whole, and any mechanical devices necessary to regulate the teeth.

(6) A school nurse, or other qualified attendant, should be present to assist the dentist at the time of treatment. The attendance of a qualified nurse is desirable for two purposes:

- (a) Attending to children before, during, and after anaesthesia, and dealing with nervous children.
- (b) Assisting the dentist and saving his time by sterilising instruments, preparing filling materials, filling up charts and treatment registers.

The substitution of an unqualified assistant for a properly qualified nurse may be inevitable on occasion, but the arrangement cannot be regarded as satisfactory. Apart from the greater experience of the latter in dealing with frightened, nervous children, there is always the possibility of hæmorrhage or other complications to be considered. In such emergencies an inexperienced substitute may be a source of anxiety and confusion.

(7) General anaesthetics, if required, should in all cases be administered by one of the Authority's medical officers, or by some other qualified medical practitioner.

In regard to the need for experienced anaesthetists for the purpose of general anaesthesia the following suggestions may be taken as furnishing the proper standard:

- (a) When any general anaesthetic is necessary, it should not be given by the operator, except in case of exceptional emergency.
- (b) The proper course for the Local Education Authority is to appoint a qualified medical man (whether a competent member of their staff, a local medical practitioner, or a specialist) as anaesthetist for all general anaesthetics in school dental clinics.
- (c) If nitrous oxide gas is the only general anaesthetic used, there is no objection to one of the appointed school dentists giving the gas for another dentist.

(8) Provision should, as far as practicable, be made for the re-examination at intervals of not more than a year, of children who have received dental treatment, and for supplementary treatment if this is found to be necessary.

The annual reinspection of children also who have passed through the dentist's hands is at least as important as the inspection and treatment of new cases; if this work is allowed to get seriously into arrears the benefit of conservative work done will be largely nullified. The periodical inspection of children with healthy dentures is most important; the consent of parents who at the time of the previous inspection refused to have their children treated should again be sought.

(9) The accommodation proposed for a dental clinic should include as a minimum (a) a play-room or waiting room, (b) an operating room (with good north light preferably), and (c) a small rinsing room, which can be used also for recovery after the administration of an anæsthetic.

(10) The dental scheme should be appropriately co-ordinated with the whole scheme of treatment devised by the Authority, particularly that part of it concerned with the therapeutics of the ear, nose, and throat, the tuberculosis dispensary, and institutions such as open-air schools, children's sanatoria, and residential recovery schools. An adequate account of the work carried out should appear in the School Medical Officer's Annual Report to the Board.

116. The Committee attach the greatest importance, in the interests of the general health of the community, to the early establishment in the area of each local education authority of a complete scheme of dental inspection and treatment.

It is not necessary for us to quote in detail the evidence submitted by witnesses as to the paramount importance of school dental work. The representatives of the British Dental Association, the Incorporated Dental Society, the School Dentists' Society, the Medical Officer of Health of Birmingham, the School Medical Officers and Medical Officers of Health of Shropshire, Derbyshire and Rhondda, representative laymen like Mr. Sidney Webb and Mr. W. C. Anderson, M.P., have all strongly emphasised to us the importance of the complete development of this branch of medical inspection and treatment. If the new Education Act had not contained a section making it the duty of local education authorities to provide for the dental treatment of children in attendance at public elementary schools, the Committee would have considered it its duty to submit a recommendation strongly urging this alteration of the law.

In the existing circumstances the Committee emphasise the importance of the Board of Education using its powers to obtain with as little delay as possible the provision of adequate dental treatment for the 6,000,000 children in elementary schools, which it is now the duty of the local education authorities to provide.

117. The number of Local Education Authorities which undertook dental treatment of children in attendance at Public Elementary Schools during the year ending 31st March, 1918, was 151. In October, 1918, 306 school dental clinics were being maintained and the number of school dentists employed was 239, of whom 49 were whole-time officers.

118. Three factors have hitherto hindered the provision of a complete scheme of dental treatment for school children. They are in order of importance:

- (1) The considerable expenditure entailed.
- (2) The shortage of dentists.
- (3) The absence of a public demand.

As regards (1), many authorities have not hitherto instituted any scheme of dental treatment for children in need of it, and although there are some exceptions, few authorities are doing more than examine and treat the children in the 6-8 year age group.

With reference to (2), the evidence, undoubtedly, is to the effect that there

is a very acute shortage of dentists available for school dental work, especially at the salary and fees which local education authorities are prepared to pay. A large proportion of school dental work is of a routine character. It mainly involves three branches of work:

- (a) Careful examination with probe and mirror.
- (b) Extractions and treatment of temporary teeth.
- (c) Treatment of the first permanent molars.

There is, however, in a smaller degree, work calling for the highest judgment and skill on the part of the dentist, which involves not merely the alleviation of pain or treatment of disease, but the future dental history of the child. The object aimed at should be to prevent disease by timely and proper treatment, the first factor of which is to do all that is necessary to allow the teeth to take a normal position in the dental arch.

119. Local education authorities object to pay for the provision of dentists, even if available, for the performance of the more routine work. We have had a good deal of evidence submitted to us on this question both from the point of view of the professional dentist and the school medical and dental service. School medical officers, such as Mr. Lewis Graham, of Birmingham; Dr. Barwise, of Derbyshire; and Dr. Wheatley, of Shropshire, were very strongly of opinion that the minor and routine work involved in dental inspection and treatment may be performed by specially trained dental dressers or assistants, provided that they work under the effective supervision of a dentist. The work was considered to be of a nature suitable for properly trained women. The only point in which there was any difference of opinion was in the nature of the supervision to be exercised. Dr. Robertson, medical officer of health of Birmingham, was in agreement with the school medical officers. On the other hand, Mr. Norman Bennett, representing the British Dental Association, gave evidence against the employment of dental dressers in operative work such as teeth extraction and filling, and Mr. G. H. Watson was also against their appointment. Having regard to the great shortage of dentists, the question is a vital one if any progress worthy of the name is to be made in school dental treatment in the next few years. **The Education Act, 1918, must remain, for many years, practically a dead letter, so far as dental treatment is concerned, unless there is a great increase in dentists, or unless dental dressers are permitted to undertake minor work under the supervision of dentists.**

120. Having regard to the supreme importance of the national health, the Committee cannot accept as satisfactory a position which will in any way hinder the bringing into operation at the earliest practicable date of a complete system of school dental treatment. The health, and with it the industrial efficiency of the future adult population of the kingdom, largely depends on the preventive dental work which will be carried out in the schools in the immediate future. There cannot be an immediate increase in the number of dentists to the extent needed. We have gathered the opinion that many registered dentists view with disfavour the employment of a class of minor dental operators even when employed in public work under public dental officers, because under the present state of the law such a class might form a centre for the creation of large numbers of unregistered dental practitioners. The recommendations which we make in another part of the report should remove this objection.

The Committee are of opinion that suitably trained and competent dental dressers or nurses acting under the effective supervision of a dentist may be usefully and safely employed in school dental work.

121. Action in this direction will be in the public interest, will tend to relieve the shortage of dentists, while at the same time it will render the position of school dentists more acceptable to the profession, and probably lead to an increased

remuneration being assigned to their posts. We think that the approval of the Board of Education of the persons to be employed as dental dressers, the nature of the work they shall perform, and of the arrangements for supervision by a registered dentist, should be necessary.

We attach importance to approval being given, as we understand is at present the case, in each individual instance rather than in the framing of general regulations to govern work of the character in question. A certain amount of operative dental work by dental dressers has already been performed without, so far as your Committee can ascertain, any sacrifice of the public interest, but they realise that this question is in an experimental stage and they would leave to the Board of Education a somewhat wide latitude as to the particular arrangements they should approve in any individual case.

122. We have had a considerable amount of evidence that a certain percentage of parents refuse to allow, or at all events do not encourage, their children to receive the dental treatment advised by the school dentist. Perhaps the strongest expression of opinion we have received is contained in an interesting memorandum from Mr. Harold Murray, L.D.S., senior school dentist for the County of Surrey. Mr. Murray states:

"Great numbers of parents have never heard that a carious tooth can be filled, and still greater numbers believe that fillings always 'fall out,' and are bound to 'cause trouble,' besides being nothing more than an obvious trick to fleece them. Their sole conception of dentistry is to leave their mouths alone unless intolerable pain drives them to extraction and, later on, to buy 'sets of teeth' if they can get them cheaply. All that, of course, means not dentistry but the lack of it.

My large experience in this kind of practice has shown me that, as a matter of national health, it will be necessary to capture the appreciation and understanding of these people, who constitute, say, eight-ninths of the total population rather than to look on the matter as one mainly of increasing the facilities and amount of qualified and reputable practice, and decreasing unqualified and bad practice. *Looking on dental work, as I do, as the most definitely preventive branch of the medical profession, the impossibility (through their own refusal) of reaching so large a proportion of the people with conservative dentistry, becomes at once the salient feature of the situation.*"

Mr. G. Hills Watson in his experience of school dentistry in Leith informed us that a great many parents, both necessitous and non-necessitous, object to having their children's teeth treated.

123. On the other hand we have had evidence that this difficulty is a temporary one which tends to disappear when an efficient dental education propaganda is adopted. There is undoubtedly a growing disposition in many parts of the country for children to avail themselves of dental treatment. Mr. Lewis Graham informed us that at Birmingham a higher percentage of parents year by year permit their children to undergo treatment, and that at the present time they have only to send out notices offering treatment for parents to bring their children up. The parents do not now have to be seen by the dentist and told that treatment is necessary. To use Mr. Graham's expression, the education of the parents is progressing "tremendously."

Sir George Newman, in his series of annual reports to the Board of Education, has frequently referred to this difficulty, and mentioned the different educational methods which have been found useful in influencing the parents. Dentist, school nurse, and teacher have each in their respective spheres assisted.

Mr. W. H. Jones, in his report on the Cambridge Dental Clinic, mentions how confidence in the work of the clinic has reduced the percentage of refusals from 29.1 per cent. in 1908 to 12.7 per cent. in 1913. Your Committee refer further

to this subject in the section dealing with the education of the public in the evils resulting from neglect of dental decay, but they believe that the expressions of opinion just quoted are more representative than the view of Mr. Murray as to conditions in the county of Surrey.

Section X.—Dental Treatment under the National Insurance Act, 1911.

124. In the two preceding sections the provision of preventive dental treatment for the young has been considered, the ultimate object of such treatment being the preservation of health and the prevention of sickness in later life. Unfortunately, the present adult population, through past neglect, has teeth which are in a state quite unfitted for the purpose of mastication. This has resulted in a mass of sickness which has mainly to be treated under the provisions of the Insurance Act, 1911.

Unless Approved Societies are to continue to pay sickness benefit for much preventable illness it is essential that an effort should be made to deal with the teeth of adults as they exist at the present time. Dental treatment is one of a number of additional benefits which an approved society may provide for its members, if after valuation of its funds a surplus exists. The additional benefits mentioned in the schedule are very numerous, and the competition between dental benefit and other very desirable competitors is bound to be very keen, if a society should be in the fortunate position of having a surplus after the first valuation.

125. One or two approved societies have, anticipating a satisfactory valuation, made arrangements for dental treatment of their members. The Domestic Workers Friendly Society was, we believe, the first to do this. The members of this Society can obtain conservative treatment free and artificial dentures at half cost. Societies in a weak financial position, a condition which applies especially to women's societies, will, however, be quite unable to provide dental benefit, and unless their members are able to obtain dental treatment in some other way will continue to have to pay large sums in sickness benefit, thus still further depleting their funds. More than this, in normal times only about half the adult population is insured. Any action by way of additional benefit could, therefore, even if complete, only affect about half the people who need dental treatment. The half remaining outside the Insurance Act comprises a majority of women, who suffer more from dental defects than men, and whose need is probably more pressing even than that of insured persons. The evidence of nearly all the witnesses we have heard, who have expressed an opinion, is that any scheme for dealing with the mass of dental neglect in adults should deal with the population as a whole and not be confined to insured persons.

126. In this connection your Committee have received the following resolution, which was passed unanimously at a meeting of the Executive Committee of the Association of Approved Societies, an association representing over 2,000,000 insured persons:

Resolution—

"In view of the fact that much of the sickness for which Approved Societies are called upon to pay sickness benefit arises directly or indirectly from dental trouble, and of the report of the Chief Medical Officer to the Board of Education, that a very large proportion of children leaving school need dental treatment, this Association of Approved Societies considers it of the utmost importance that a Public Dental Service should be instituted in every locality, adequate treatment being available for all who need it, irrespective of their financial position."

A similar resolution has been sent to the Committee by the Association of Approved Societies' Secretaries.

The Committee deal with the question raised by this resolution in the section on the provision of a public dental service.

Section XI.—Miscellaneous Voluntary Aids to Dental Treatment.

127. *Hospital treatment.*—The dental hospitals afford a considerable amount of conservative treatment of the best kind. Unfortunately, the number of such hospitals is so few that the amount of work they are able to accomplish deals with but a small fraction of the dental disease awaiting treatment. They only exist in towns where there are dental schools, which are practically confined to towns having Universities. In general hospitals it is the exception to provide any treatment except extractions, with in many cases the provision of artificial dentures at a reduced price by means of the assistance of some local charitable organisation.

128. *Other Charitable Organisations.*—Various charities afford aid in the provision of dental treatment. Among these are the Saturday and Sunday Hospital Funds, the Charity Organisation Society, Voluntary Aid Societies and the society known as the Ivory Cross. This last is a charitable organisation which aids the provision of dental treatment and artificial teeth. Early in the war its activities were mainly directed to assisting recruits in obtaining dentures. Latterly it has assisted expectant and nursing mothers and also discharged soldiers. The work done by these various societies is very useful, but it has formed but a very small contribution towards remedying the great mass of existing dental neglect.

129. *Public Dental Services of Registered Dentists.*—Conservative dental treatment means the expenditure of much time, and is, in consequence, expensive. Your Committee are of opinion that such treatment cannot be afforded by the working classes at the fees that are habitually charged. Registered dentists recognise this, and associations have been formed by them in some towns for the purpose of providing persons of limited incomes with dental treatment at a reduced scale of fees. The treatment provided is the best professional conservative treatment supplemented by the provision of artificial dentures when these are necessary. The war has impeded the development of activities in this direction, but so far as they have gone these public dental services set up by dentists have performed a valuable work. It is usual to have a fixed scale of fees and to confine the service to persons whose incomes are below a certain level, usually that fixed by the Insurance Act. The British Dental Association have encouraged the formation of associations of this type, and Mr. Norman Bennett has furnished the Committee with a list of associations. Some difficulty, however, appears to have been experienced in making their existence known among the classes they are intended to serve.

The most complete association of the kind in question which has been brought to our notice is the "Scottish Dentists' Association, Limited." The Association has supplied the Committee with a memorandum explaining in some detail its origin, constitution and operations, from which the following extracts have been taken:

"In November, 1913, a number of dentists who were connected with the Dental Hospital established a Clinic in the Partick District of Glasgow for combating the activities of the unqualified practitioner. These gentlemen fitted up premises and guaranteed the necessary expenses of wages, rent, taxes and cost of material. The premises were opened in the evening and were staffed by the originators of the scheme who each gave attendance for two or three hours per night in rotation. The idea was spread and a second clinic was opened in similar circumstances in the South Side district of the city. A Central Association—the Glasgow and West of Scotland Dentists' Association—was formed to co-ordinate the work and on 9th April, 1914, The Scottish Dentists' Association, Ltd., which absorbed the earlier association, was incorporated after consultation with the Board of Trade.

The Scottish Dentists' Association is a company limited by guarantee of its members and no profit is divisible among the members."

* * * * *

"The initial funds amounting to £400 were subscribed by guarantee of members.

The membership to-day is 142.

The Clinics are fitted and furnished on a common plan and the premises include in each case a surgery, waiting room, and lady attendant's office.

The evening being the most suitable time to get in touch with the class for whom the service is intended the rooms are open from 5 p.m. to 9 p.m. From 5 to 7 the attendant interviews patients and makes appointments and from 7 to 9 the operators are in attendance.

The present Clinics are open at 181, Crown Street, South Side, Glasgow, and 2, Cranston Place, Anderston, Glasgow, two of the most densely populated districts in the City. The staff of operators consists of eleven dentists. Almost 4,000 patients have received treatment, but since the commencement of the war the natural development of the Association has been checked. Many of the operators are on active service. The shortage of dentists in the district made the hours of attendance a heavy tax on the dentists left, and the alteration of the hours of employment of patients together with the lighting restrictions have all tended to check progress.

The Association is the only body at present carrying on this public dental service in Scotland, and the idea, which would have been persevered in but for the war, was to extend its operations throughout the Kingdom of Scotland."

"The scale of fees which are charged to patients are:

		per tooth.
1. Extractions.	(a) Without anæsthetic	6d.
	(b) With local anæsthetic	1s.
	(c) With gas 3s. 6d. and	1s.
		per filling.
2. Fillings.	(a) Amalgam, &c.	3s. 6d.
	(b) Sythetic porcelain	4s. 6d.
	(c) Gold	£1 1s.
	(d) Crowns	£1 1s. each.
	(e) Inlays	£1 1s. "
3. Dentures.	(a) Full upper or lower with extractions 5s. extra	£2 10s.
	(b) Partial upper or lower.....	3s. 11d. p. tooth.
	(c) Single tooth	5s.
	(d) Remodels	£1; 3s. 6d. p. tooth.

* * * * *

"These fees compare very favourably with the amounts charged by unqualified persons and in addition the highest dental skill is available to the patient."

Mr. Towart referred to the work of the association in Glasgow, and we gathered that owing mainly to the fact that the Association is unable to advertise, the success of the Glasgow branches has not been as great as could be desired.

In Dundee a dental service in close association with the local dental hospital has been inaugurated.

130. *United Dental Service of the Incorporated Dental Society.*—Certain members of the Incorporated Dental Society before the outbreak of war formed a company under which treatment was given to the necessitous poor at a recognised scale of fees. We have formed the opinion, however, that like the public dental services set up by registered dentists this somewhat similar organisation of unregis-

tered practitioners has not been able to make much impression on the mass of dental disease needing treatment or in reducing the mass of dental work performed by undesirable practitioners who canvass from house to house. We mention this particular organisation here as it clearly indicates that in the opinion of the most representative association of unregistered practitioners some form of public dental service is necessary.

Section XII.—A Public Dental Service.

131. In the preceding sections the public dental assistance that has been provided, or is in course of being provided by local authorities assisted by grants from the public exchequer has been outlined.

Briefly it is as follows:

1. For children under 5, not in attendance at school, through child welfare centres aided by grants from the Local Government Board.
2. For children in attendance at elementary schools, by local education authorities aided by grants from the Board of Education.
3. For expectant and nursing mothers, through maternity centres aided by grants from the Local Government Board.
4. For persons suffering from tuberculosis, by County Borough Councils and County Councils aided by grants from the Local Government Board.

132. Under the provisions of the Education Act of this year this dental assistance will be supplemented by dental treatment which local education authorities may provide for children under 5 or 6 years of age who are attending nursery schools, and also for children and young persons who after leaving the public elementary school may attend a continuation school, secondary school or other institution up to the age of 18.

133. Broadly speaking the State has undertaken, with the assistance of local authorities, to aid the dental treatment of the child and school population up to the date when the scholar ceases to attend school. For the adult population the State, so far, has only undertaken to assist selected sections of the population.

134. In considering our terms of reference we have been obliged to endeavour to forecast in what directions public dental treatment is likely to be increased in the future, as the provision in adequate numbers of an instructed and trained dental profession sufficient to meet the requirements of such treatment will be essential. Witnesses before the Committee have in various ways coupled with the prohibition of dental practice by unregistered practitioners the provision of a public dental service. We, therefore, have found it necessary to express our views on the subject of the provision of a public dental service.

135. If it be accepted that it is the duty of the State to ensure in the national interest that its citizens shall be maintained in a state of good health and working efficiency we have no hesitation in stating that adequate arrangements for keeping the teeth of the people in a sound condition are one of the essentials to this end.

There is no doubt from the evidence submitted to us that, provided an adequate and periodical dental inspection supplemented by conservative treatment of the teeth of the people could be ensured, the gain to the community both in improved health and in increased efficiency in labour, both manual and mental, would be very great.

136. We consider the question under two heads:

- (1) Treatment to ensure the sound condition of the teeth of future adults.
- (2) Treatment of the teeth of adults.

(1) TREATMENT TO ENSURE THE SOUND CONDITION OF THE
TEETH OF FUTURE ADULTS.

137. To achieve this result a beginning ought to be made at the beginning. As we have shown in Section VIII, the provision of dental advice and treatment for young children is now possible in connection with the Maternity and Child Welfare centres which are in process of being established and developed by local authorities throughout Great Britain with the assistance of State grants administered by the Local Government Board and the Local Government Board for Scotland. The attendance of mothers with their young children at these centres is rapidly increasing.

Having regard to the evidence before us as to the condition of the teeth of children on entering on school life, we are of opinion that the extension on a large scale of dental inspection and treatment to children in the pre-school period of life constitutes a most important part of a general system of preventive dental treatment.

Adequate card records should be kept of the dental condition of each child with a note of the treatment which it has undergone. These cards should be available for the use of the School Medical Officer when the child enters school.

138. In future, by the natural development of the school dental service, every child in attendance at a school aided by the State will, if the requirements of the Education Act, 1918, are met, come automatically under dental inspection, and, in the case of children in attendance at Public Elementary Schools, under treatment. The foundations of a satisfactory school dental inspection and treatment have already been laid, and it is only necessary that this inspection and treatment should be developed to its normal completion for every child to leave school with its teeth in sound dental condition. **The ideal to be aimed at is to inspect and treat the child early after its admission to school, to keep the child under such periodical inspection and treatment as may be necessary, and finally to send the child out on its life's work with its teeth in good condition.** Nearly every witness we have heard has emphasised the need for a full development of the school dental service. The necessity for this has been particularly strongly emphasised by Mr. W. C. Anderson, M.P.

139. Professional witnesses, with the striking exception of Dr. Jenkins, of Rhondda, were in the main agreed that although an adequate school dental service would require in the present an increased supply of dentists, nevertheless, owing to the improved condition of the teeth of the people which would result, the necessity for dental treatment in later years would be diminished. Dr. Jenkins, in reply to a question, stated:

"Where young people are now supplied with artificial dentures it means that the dental attention required for the rest of their lives will not be quite so great probably as it would be in the case of natural teeth, which would very often require attention. That is my own experience and the experience of others."

Mr. Sidney Webb, regarding this question from a somewhat different angle, was of opinion that probably the higher standard of dentistry that the public would demand in the future would prevent any effective saving in dentists. He stated:

"I do not think you can regard as a net saving of dentistry the lessened need that you may possibly make by conservative dentistry up to 18, because, against that you have to put the higher standard that will be required, and you will want a great many more dentists."

140. The broad general effect of a satisfactory system of school medical inspection and treatment will be to increase the demand for conservative dentistry and

to diminish the demand for extractions and artificial dentures. We have strongly expressed our approval of a system of dental dressers in school dental work under competent supervision. This should lead to a considerable saving in the time of school dentists. While we are in complete agreement with the Board of Education that the inspection and treatment of entrants into school life is the most pressing portion of school dental work, we nevertheless are of opinion that **every effort should be made to ensure that no child or young person leaves the control of the local education authority without its teeth being examined and treated if necessary.** We attach great importance to such treatment, and we should like to see established a system under which a school dentist would furnish to a child or young person leaving school a certificate that the teeth had been examined on a given date and any dental treatment required executed. In the section on educational instruction of the public in dental matters we deal further with the uses to which such a certificate could be put.

With comparatively few exceptions every child has to attend school, so that an opportunity occurs, and occurs in this service only, of bringing nearly every member of the population of a definite age group under treatment.

(2) TREATMENT OF THE TEETH OF ADULTS.

141. It will have been gathered from previous sections that the teeth of the adult population have been greatly neglected, and that the national health is suffering from such neglect. This implies among other results that insurance funds are being spent, and a large mass of chronic invalidity has resulted from this neglect. Among the causes of this neglect, undoubtedly, in certain sections of the community, the high cost of conservative treatment takes a very prominent place.

Satisfactory conservative treatment of the teeth of the present adult population is not possible, owing to this past neglect. A large amount of dental work is, however, needed for extractions and the provisions of dentures.

142. The provision of an adequate dental service to meet the existing needs is impossible at present owing to the shortage of dentists, but your Committee are strongly of opinion that, simultaneously with the enforcement of prohibition of unqualified practice, the nucleus of a public dental service should be set up in populous areas for the treatment of dental disease, and that dental treatment by such a service should be available for persons needing it free of charge. We think that the service should be established as a definite branch of public health work and should be entrusted to public health authorities. The dental clinic or other service provided should work under the general direction of the Medical Officer of Health and the Public Health Committee of the local authority. We look forward to close co-operation between the local education authority and the public health authority in providing for the dental needs of the public. In order to prevent overlapping, and to facilitate co-operation, we think there would be advantage in limiting the public health authorities to those authorities whose districts are coterminous with Local Education Authorities under Part III. of the Education Act, 1902, *i.e.*, the Councils of Administrative Counties, County Boroughs, Boroughs with a population exceeding 10,000, and Urban Districts with a population exceeding 20,000 in 1891.

As the Medical Officer of Health of such areas is usually the School Medical Officer every facility will exist for establishing the closest possible co-operation, including, usually, common action between the School Dental Service and the Public Dental Service.

143. The Public Dental Service we have suggested will normally be administered centrally by the Minister for Health, when a Health Ministry is created. Meanwhile we think the service should be administered by the Local Government Board. As in other preventive medical services, *e.g.*, treatment of tuberculosis,

treatment of venereal diseases, and maternity and child welfare work, a grant from the Exchequer should be payable in respect of expenditure on schemes of dental inspection and treatment which receive the approval of the Minister of Health (Local Government Board).

144. We would point out in this connection that the powers of Public Health Authorities to provide treatment for dental disease are at present somewhat defective and we recommend that similar powers for the treatment of dental disease should be conferred on County Councils and Sanitary Authorities as they possess for the treatment of tuberculosis under Section 3 of the Public Health (Prevention and Treatment of Disease) Act, 1913.

Meanwhile pending the passage of an Act conferring such powers, and in order that the nucleus of schemes may be proceeded with without delay we think the Local Government Board should be prepared in respect of schemes which have received its approval, to sanction, if necessary, expenditure under the Local Authorities (Expenses) Act, 1887.

145. The development of public dental services will be hampered at the start by the shortage of dentists, but we are of opinion that in the general health interests of the people they should be established without any delay, and we are agreed that a sufficiency of dentists will probably be available to start services in most populous localities. Dental dressers, working under the effective supervision of a dentist, may usefully form a part of some public dental services.

These recommendations in respect of a public dental service are in accordance with the weight of evidence submitted to us. Some witnesses submitted that prohibition of dental practice by unregistered practitioners should only be put in force in districts in which a public dental service had been established, but we are of opinion that this course would be difficult in practice.

Section XIII.—The Education and Training of Dental Practitioners.

146. As already briefly stated the Dentists Act, 1878, provides for the education, training and examination of persons desirous of being registered under the Act as dentists. Before considering No. 3 of our terms of reference it is desirable to state in some detail the provisions of the Dentists Act bearing on the education and examination of dental students.

The following are the main features of the Act in this respect:

- (1) The dental examining authorities are the Medical Authorities who have power to grant surgical degrees.
- (2) The examining authorities are empowered to conduct their examinations by a board of examiners, not less than six in number, of which not less than half shall be registered dentists.
- (3) The examining authority must admit any person to their examinations who has attained the age of 21 years and has "complied with the regulations in force (if any), as to education, of the examining authority."
- (4) The General Medical Council are entitled to be furnished with such information as they may require as to the course of study and examinations to be gone through, and generally as to the requisites for obtaining a certificate conferring the right to registration.
- (5) Any member of the General Medical Council, or any person deputed for the purpose by the General Council or any Branch Council, may attend and be present at examinations.
- (6) The General Medical Council may make representations to the Privy Council that the course of study and examinations "are not such as to secure . . . the requisite knowledge and skill for the efficient practice of dentistry or dental surgery."

- (7) The Privy Council, on receipt of such representation, may, if they see fit, make an order which has the effect of suspending, after a given date, the conferring of a certificate entitling to registration.
- (8) The Privy Council may revoke such order, when they are satisfied that effectual provision, to the satisfaction of the General Council, has been made for the improvement of such course of study and examination.

147. Briefly the Dentists Act contemplates that the initiative in framing courses of study and examinations for a registrable qualification should rest with Medical Authorities conferring surgical degrees. The supervision of courses of study and examination to preserve an adequate standard rests with the General Medical Council who from time to time have inspected the examinations and published the inspectors' reports. The final authority remains with a Minister responsible to Parliament—viz., the Lord President of the Council.

148. The General Medical Council has framed a system of supervision depending on the issue of recommendations for the guidance of licensing bodies. These recommendations aim at securing:

1. The registration with the General Medical Council of dental students at the commencement of their studies.
2. A four years' course of professional study.
3. Courses of instruction in certain "General Subjects," to be attended at a recognised Medical School for a specified minimum period.
4. Courses of instruction in certain special dental subjects to be attended at a recognised dental school for a specified minimum period.
5. The examination of students in specified subjects, the examination being partly oral, partly written, and partly practical.
6. The final examination in dental surgery and mechanical dentistry shall be taken after the completion of four years' course of study.

We desire at once to draw attention to the following points:

No. 1.—This has the effect of securing that the student has passed a preliminary examination in general education recognised by the General Medical Council.

No. 2.—The course may be reduced to 3 years in the case of a *bonâ fide* apprenticeship to a registered dentist, if one year of apprenticeship has been served subsequently to the date of registration as a dental student.

No. 3.—These general subjects include certain medical and surgical subjects and also chemistry and physics, and form a portion of the curriculum of a medical student. Chemistry and physics may be studied at a science school recognised by a licensing body.

No. 4.—These special subjects are dental subjects outside the curriculum of a medical student. Instruction in one of them "Two years' practical instruction in Mechanical Dentistry," may be received either from a registered dentist or in the Mechanical Department of a recognised Dental School and Hospital. It is to be noted that if received from a registered dentist it must be after registration as a dental student.

It is to be observed that recommendations of the General Medical Council are for the guidance of licensing bodies and that it is not compulsory on the licensing bodies to adopt them.

149. The General Medical Council has during the last few years been carefully considering with the assistance of suggestions from dental licensing bodies and recognised dental schools the courses of study and examinations which it has hitherto recommended. The dental education and examination committee has reported to the Council certain alterations which it has recommended. The Council have adjourned consideration of this report in view of our appointment.

The Council have furnished us with full information of the proposed alterations, together with the observations of the licensing bodies and dental schools.

150. We carefully considered these documents at an early stage of our deliberations and decided ourselves to address a further circular letter to the licensing bodies and dental schools. This letter was as follows:

Circular to Dental Licensing Bodies and Dental Schools.

Dentists Act Committee,

26th November, 1917.

SIR,

I am directed by the Dentists Act Committee, which has been appointed by the Lord President of the Council, to enclose for the information of the Licensing Bodies and Dental Schools, a copy of their terms of reference and to direct your attention especially to (3).

The Dentists Act Committee will be much obliged if they can be favoured with any observations which will be useful to them in reporting on this part of their reference.

The General Medical Council have supplied the Dentists Act Committee with copies of their minutes, from which the members of the Committee have become cognisant of the terms of the circular of 11th March, 1915, addressed by the Dental Education and Examination Committee of the General Medical Council to each of the bodies granting dental qualifications and to the principal dental schools. The Committee are also aware of the replies which have been received in response to this circular letter and of the reports made thereon to the General Medical Council by the Dental Education and Examination Committee, the final report now being before the General Medical Council.

The documents in the hands of the Committee show the importance that each of the licensing bodies and dental schools attaches to an alteration of the law with a view to restricting unqualified dental practice. The opinions expressed as to the effect of the present law are explicit and unmistakable, and the Dentists Act Committee do not think it necessary to trouble the licensing bodies and dental schools to express any further observations on this point.

It may be pointed out that while their terms of reference would enable them to recommend that it is desirable further to restrict or to prohibit unqualified dental practice, and in that event to suggest the conditions under which certain classes of unqualified persons at present engaged in the practice of dentistry might be permitted to continue in practice, the third paragraph of their reference must be considered in this connection.

Restriction or prohibition of unqualified practice, if a satisfactory dental service is to be provided, implies the necessity of a greatly increased number of registered dentists with its corollary of an increase in the number of dental students seeking to enter the profession.

If any recommendation should be made as to the prohibition of unqualified practice it is important that an adequate supply of dental students should be forthcoming to provide a sufficient and efficient dental service for the public and private requirements of the community. The war has taken its toll of both qualified and unqualified practitioners and has thus not only diminished the number of dentists, but has also quickened the rapidly increasing appreciation on the part of public bodies and private individuals of the importance of attention to the preservation of the teeth. It is therefore important that the course of study which students have to pass through should in length, content, and cost impose no greater obstacles to the active recruitment of the profession, than are absolutely necessary in order to secure for the public efficient treatment.

The Committee have requested me to mention the foregoing considerations as it has been suggested that, even in the short period that has elapsed since the replies to the circular letter of the 11th March, 1915, were sent in, the position has undergone considerable modification.

The Dentists Act Committee would, therefore, be obliged if the licensing bodies and dental schools would carefully consider:

1. Whether a modified preliminary examination should entitle a student to commence his professional studies. In this connection the Committee have asked me to direct your attention to the proposals of the Board of Education with regard to the first school examination contained in circular 849 of the Board of Education enclosed herewith. The arrangements for this examination are now being organised by the Board of Education. We understand that the establishment of such an examination has been looked upon with approval by several professional bodies including the General Medical Council.

2. Whether any modification is desirable in the length of the professional course of study, the subjects which are included in such course, and the stringency of the examinations required. The Committee will be glad to be furnished with any other suggestions tending to reduce the cost of training dental students.

The Committee desire me to ask you specially to consider the following points in this connection:

- I. (a) Whether the six months' course in chemistry and physics which is now required to be taken as a part of a student's professional studies could not with advantage be replaced by evidence that the student had taken an approved course of chemistry and physics, including laboratory work, at a secondary school.
- (b) Whether in such cases the possession of a 1st or 2nd school examination certificate including a pass in science could be recognised in lieu of the present examination in physics and chemistry.
- II. Whether the time devoted to the more general medical courses is being spent to the best advantage and whether the courses should be in any particulars curtailed, and, if necessary, more time devoted to dental subjects.
- III. Whether the instruction and practice in dental mechanics should only be permitted in a dental school and the practice of private pupilage abolished.
- IV. Whether a 3 years' course of study with some relaxation in the stringency of the professional examination could be accepted for a registrable diploma in dentistry. If so, what safeguards should be taken to ensure a uniform standard in this lower examination.
- V. If IV. be adopted, whether a higher diploma or degree should be awarded either:
 - (a) after a further course of study of at least one year, or
 - (b) after a course differing in its extent from that suggested under IV. above and having a wider range and extending over a longer period.

The Committee while asking the different Licensing Bodies and Dental Schools to express the fullest opinions on the subjects mentioned above would feel obliged if they could severally submit to the Committee a course of study and examination which they consider would be the most suitable, *the whole course being limited to 3 years*. In making this request I am to explain that it must not be understood that the Committee is in any way committed to the view that a 3 years' course of study is adequate.

The Committee will also be glad to be furnished with any of the following statistics which the Licensing Bodies or Dental Schools may be able to supply:

- (1) The percentage of *medical* students who pass their final examination after not more than 5 years of study.
- (2) The percentage of *dental* students who pass their final examination after not more than 4 years of study.
- (3) A statement as to the numbers of dental students taking their instruction in dental mechanics (a) at a dental school, (b) as a pupil of a registered dentist.
- (4) Statistics contrasting the percentage of successes in dental mechanics at the 1st professional examination according as to whether the student undertook his training at a dental school or with a private practitioner.
- (5) Any information that may be available as to the number of students who after commencing their professional training at a dental school do not seek to qualify for registration under the Dentists Act, 1878, but leave the school to practise as unregistered practitioners.

The statistics should, if possible, be given from 1900 or for as long a period as is available.

I am, Sir, &c.,
F. H. O. JERRAM,
Secretary.

This letter has been very carefully considered by the different licensing bodies and schools and we have had many full and valuable replies for which we desire to express our gratitude.

151. We referred the replies to a sub-committee consisting of the medical members of the Committee. We have also heard in evidence Sir Donald Macalister on behalf of the General Medical Council and Colonel H. J. Waring and Mr. F. G. Hallett, representing the Royal College of Surgeons of England. The views of other licensing bodies and dental schools were very clearly set out and we did not find it necessary to invite witnesses to give evidence before us. We have considered the dental curriculum in connection with the scheme of examinations (1st school and 2nd school examination) which is now being instituted in secondary schools by the Board of Education. That Board under its regulations now pays special grants from the Exchequer to approved secondary schools presenting candidates for these examinations.

152. Before stating the conclusions we have reached and the recommendations we make we desire to draw attention to the tendency of the present age to prolong school life, and we think this has a very pertinent bearing on professional education. The Board of Education now contemplates a secondary school education up to the age of 18, especially for a boy or girl who does not propose to proceed to a university. It is not desirable in our view that a professional education should tend to shorten school life or that there should be included in the professional course of study subjects which more properly belong to a general education. We think that the minimum course of professional study should not be longer than a student who has completed a full secondary school course would require to undergo to enable him to pass his professional examinations. We notice that dental students may commence their course of professional study on reaching the age of 16. We are of opinion that a boy or girl who completes a course of study at a secondary school up to the age of 18 would probably be in a better position to profit from a course of professional study than one of the age of 16. The period 16 to 18 is a very valuable period of school life which it is particularly inadvisable to omit. In the recommendations we make for a minimum curriculum for dental students we contemplate students entering the dental profession after a full secondary school course. Dental students cutting short their secondary school course will probably need to spend longer over their professional course of study. We are satisfied.

however, that the period we suggest should suffice for well educated boys or girls who have completed their secondary education before taking up professional study.

We make the following specific recommendations:

Preliminary Examination.

153. We think that it is essential that a student, in ordinary circumstances, should have passed a preliminary examination in general education which should be the same for dental students as for medical students. This examination should, we think, be the normal leaving examination usually passed by a pupil, after an approved course of study at a secondary school. Either the 1st or 2nd school examination would be a suitable preliminary examination before commencing a professional course of study. Latin should not be a compulsory subject for a student entering a course of professional study as a dentist. If any particular subjects of a general education are to be obligatory they should be science subjects. A knowledge of Mathematics, Natural Science, English and another language comprises the elements of a suitable preliminary examination. The choice of subjects within each of these groups should be free.

The General Medical Council, before admitting a student to the dental students' register have, in the past, required that he shall have passed a preliminary examination with Latin as a compulsory subject. The Council, however, has recently made Latin optional in the senior examinations while retaining it as a compulsory subject in the junior examinations.

We recommend that the Council shall no longer insist on Latin as a compulsory subject in any of the preliminary examinations which it accepts.

Preliminary Science.

154. It is desirable that the course of study in Chemistry and Physics should form a portion of the normal school course. A pass in science with credit in Chemistry and Physics in the 1st school examination in secondary schools inspected by the Board of Education, should be accepted as entitling a student to enter his professional examination in these subjects, a pass in Chemistry and Physics in the 2nd school examination should be accepted as an adequate substitute for the professional examination in these subjects. Several of the licensing bodies have expressed their willingness to adopt this course. In making this recommendation we are in substantial agreement with a somewhat similar recommendation by the Committee on the position of natural science in the educational system of Great Britain. We believe that a systematic course of physics and chemistry spread over several years at a secondary school is of greater value than the rather fevered 6 months' course in these subjects which the present dental curriculum generally requires. We are also of opinion that a dental student before commencing a course of professional study should have received some preliminary instruction in biology.

Length of Dental Curriculum.

155. The minimum course of professional study recommended by the General Medical Council covers a period of 4 years, of which one year of *bonâ fide* apprenticeship to a registered dentist, if served subsequently to the date of registration, may be reckoned as a portion of the four years of professional study. Apprentices need, therefore, only undergo a course of 3 years at medical and dental schools included in which are courses of instruction in Chemistry and Physics.

The Royal College of Surgeons informed us that 85.9 per cent. of dental students during the period of 1905-14 took their dental mechanics with private practitioners. Presumably the majority of these students were apprenticed.

As more than half the licentiates in dental surgery in the United Kingdom hold their licences from the Royal College of Surgeons it appears that in effect the

greater proportion of registered dentists holding the licence in dental surgery have only been required to complete a minimum course of study of 3 years' duration at approved medical and dental schools.

156. The Royal College of Surgeons while not in favour of shortening the present course of study have stated to us that if the Government decide that prohibition of unqualified practice be not granted unless some concession be made, the College in order to secure to the community the great advantages which would result from such prohibition, would be prepared to grant its licence on a modified course of study and examination covering a period of 3 years.

We are of opinion that it is essential to reduce the cost of obtaining a registrable diploma in dentistry, and we are of opinion that a three years' course of study should be the minimum prescribed course of study for dental students. A student taking this course should have completed his training in preliminary science, which we recommend should be the same as for medical students, before entering on his professional studies, and his training and instruction in dental mechanics should be undertaken in a dental school.

157. The framing of a suitable curriculum for such a course should rest with the different licensing and teaching bodies subject to the supervision of the statutory dental board (recommended para. 182) of the General Medical Council and the final control with the Privy Council as at present. Courses have been submitted to us, but we do not propose to comment on the details. There are, however, several general matters on which we desire to offer observations.

The General Medical Subjects.

158. We think that the teaching of anatomy, medicine and surgery for dental students should be special for them unless under conditions specifically approved by the statutory dental board. Suggestions that have been made to us are in the direction of lightening the portion of the curriculum dealing with general medical subjects and giving more attention to the special dental subjects. We approve of these suggestions.

Apprenticeship.

159. Private pupilage as an apprentice may be an ideal way of instruction in dental mechanics under a dentist who has the gift of imparting the technique and knowledge of his craft to his pupil. On the whole, however, we are of opinion that teaching at a school is preferable to private pupilage. We think that if private pupilage is to be continued, it should be restricted by safeguards to be framed by the statutory dental board. In any case we are of opinion that if instruction in dental mechanics should be permitted by a dental licensing body as a portion of a prescribed course of professional training the time devoted to it should be twice the length of corresponding instruction at a dental school.

Two Classes of Registered Dentists.

160. We have received a carefully prepared scheme from the clinical dental committee of Leeds University designed to secure rapidly an increase in registered dentists by the creation of a special class of dentists known as "certified dental operators." A two years' course of training designed to "ensure a high standard of efficiency in operative skill" was proposed. The saving in time was obtained by omitting instruction and practice in dental mechanics. It was proposed that these "certified dental operators" should be placed on a separate roll from that containing the names of the more fully qualified dental surgeons.

We do not think it desirable for various reasons to set up two classes of registered dentists, and we are unable, therefore, to approve these proposals.

Dental Mechanics.

161. We have approved elsewhere (para. 218) of the suggestion that was made to us by witnesses from the Royal College of Surgeons of England that a diploma in dental surgery should be awarded as a temporary measure to dental mechanics at present in practice after a suitable two years' course of instruction. The total estimated cost of all fees would be about £100. A scholarship of £300 spread over two years would provide for the expenses and a suitable maintenance grant for the mechanic.

162. If a licensing body is prepared to grant its licence in dental surgery to dental mechanics who have been in practice for a period of five years at the date of our Report, and on their undertaking an approved course of study of two years' duration and passing the first and second professional examination of the Royal College of Surgeons of England—or in the case of other college examinations the corresponding examinations, we are of opinion that the Statutory Dental Board and the Privy Council should not raise any objection to it as a temporary measure.

Such diplomas should only be granted to dental mechanics after unregistered dental practice has been prohibited.

Section XIV.—Control of the Dental Profession.

163. The statutory body controlling the dental profession is the "General Council of Medical Education and Registration of the United Kingdom," known more generally as the General Medical Council. Its control is exercised in two directions:

- (1) Education.
- (2) Discipline.

We have dealt with educational control in the section on the dental curriculum.

As regards discipline the control exercised by the Council rests on its power to remove the name of a dentist from the dental register, thus depriving him of his statutory rights as a dentist.

164. The General Medical Council has the assistance of a Statutory Dental Committee consisting of 5 members elected by the General Medical Council from its own members. The investigation of the facts relating to all complaints against registered dentists which the Council requires to be investigated is made under Statute by the Dental Committee. The judgment as to "the facts" rests solely with the Dental Committee which reports to the General Medical Council, which alone has the power of inflicting any punishment, *e.g.*, removal of the name from the dental register.

165. The General Medical Council consists of 48 members, of which 14 are chosen by the Universities and other bodies in England and Wales conferring licences to practise medicine and surgery, 7 chosen by similar bodies in Scotland, 6 chosen by similar bodies in Ireland, 5 nominated by His Majesty with the advice of His Privy Council, and 6 direct representatives elected by registered medical practitioners.

166. Only about one-third of the members of the General Medical Council must be medical practitioners. At the present time, however, every member of the Council has medical qualifications. Only one member is a registered dental practitioner—one of the Crown nominees on the Council. The position is a remarkable one in that the profession of dentistry is entirely controlled by members of the profession of medicine. We inquired of Sir Donald Macalister as to the reason of the existing position. He expressed the following opinion:

"Dentistry was originally put under the Medical Council because there was no dental profession. We had the machinery and we had parallel problems to

solve, and I take it, it was placed under the jurisdiction of the General Medical Council solely for the reason that that was the existing body, and that there was no corresponding existing body or constituency from which a body could be appointed for the dentists."

167. Another reason that partly explains the anomaly of one profession governing another is that a medical practitioner, by reason of his medical registration, has the statutory right to practise dentistry although his medical qualification does not constitute a registrable qualification for admission to the Dentists' Register. That the General Medical Council feels that its constitution is not satisfactory for administering the Dentists Act is indicated by a resolution which was adopted at its meeting on the 27th November, 1917, and transmitted to the Lord President of the Council, who has forwarded a copy to us. The resolution is in the following terms:

"That it would be of advantage to the Council, in administering the Dentists Act, if provision were made for the appointment to the Council of members representative of the Dental Profession."

168. The question of the future control of the dental profession is one which has presented considerable difficulty to us. We are agreed that under ordinary circumstances, subject to adequate safeguards for the public, every profession should be self-governing. The social status of a profession and its individual members is intimately connected with its government, and it can hardly be disputed that the government of one profession by another tends to lower the status of the former. The position is, however, very far removed from the ordinary, and in present day dental politics there is, perhaps, no subject on which there is more controversy or divergence of opinion.

169. Sir Donald Macalister informed us that the General Medical Council had not had before them officially the question of the government of the dental profession by a body distinct from the Council. He stated: "There have been many conversations with representatives of the dental profession, and, so far as I am aware—except for one or two expressions of doubt or dissent—the opinion I have heard expressed by members of the Council has been in favour, sooner or later, of a distinct body being established for the government of the dental profession." In reply to a suggestion that an oculist and a dentist were equally specialists in the science of medicine, Sir Donald explained that the speciality of the former came after his general training and qualification in medicine, whereas he did not regard a medical qualification as an essential preliminary to dental work. He regarded a dentist who did not take the medical qualification as a person who qualified for his profession in a different way from a doctor, and he saw no reason why dentists should not be governed in a different way.

Again expressing his personal opinion, he had the impression that if the establishment of a separate Dental Council for the control of dentists emerged from the report of the Committee he did not think the General Medical Council would be likely to object. The general view would be that dentistry is now a profession with regard to which such a change might be made.

170. Sir Donald informed us that he was not satisfied with the control which the General Medical Council was able to exercise over the dental profession. This control he regarded as imperfect in regard of dental practitioners who had been admitted to the dental register without any special qualifications in 1878. Sir Donald stated in regard of these particular practitioners:

"They constituted a body of men who had different traditions from those who had passed through the regular curriculum and were licentiates of a College of Surgeons. Their practices were different, and it was extremely difficult—we constantly found it so—to bring them up to the same level of what we should regard as sound professional conduct, or to make regulations

in regard to such professional conduct as would include them, in the same way as we could make regulations for the conduct of those who had otherwise come on the register and now come on the register."

He agreed that if any change was made in the present dental register comparable with that of 1878, the General Medical Council would have to begin all over again the experience of the twenty years following the Dentists Act of 1878; though he admitted the task would be different if the Council had power to prohibit a man from practising. At present the removal of a man's name carried with it no disability.

171. To remove such a difficulty, he suggested that the General Medical Council would require to be armed with more drastic powers over those whose practices have hitherto been conducted in a different way from that which the General Medical Council think proper. The Council had suggested to the Lord President of the Council a system of annual licences as a suitable method of control in place of a lifelong registration, as it would be simpler to withhold renewal of an annual licence from a practitioner for failing to come up to a proper standard than to exercise the powers of the Medical Council by judicial inquiry and sentence.

172. Pressed as to whether it was desirable for the Committee to recommend the government of the dental profession by the General Medical Council, increased by dental representation rather than by the establishment of a separate Dental Council, Sir Donald agreed that in present circumstances, in view of the probable disposition of Parliament, it would probably be the wiser course, but he added that he did not regard it as necessarily the final one, but rather as a step in the evolution which he regarded as ultimately inevitable.

173. We have thought it desirable to state somewhat fully the views of the General Medical Council with regard to control of the dental profession and the difficulties following the Dentists Act, 1878, when the registered dentists comprised a large majority of practitioners who had not undergone any prescribed course of instruction and training. The dental register formed after any Act prohibiting the practice of dentistry by unregistered practitioners will probably for a number of years parallel the conditions following 1878 to this extent, that a majority of the dentists on the register will not be licentiates in dental surgery. We are of opinion that this position must be carefully borne in mind when considering what is the most suitable body to which the control of the dental profession should be entrusted, and it no doubt has had considerable weight in influencing the evidence submitted to us by the dental profession.

174. Mr. Norman Bennett, representing the British Dental Association, explained that there was great difference of opinion in the Association, but that the majority shared the view he personally held that control by the General Medical Council was preferable to setting up a dental council. He favoured such control both on the grounds of merit and expediency. He regarded the close association with the medical profession as good for the dental profession generally, and he thought it unlikely that any Dental Council would receive powers comparable to those already exercised by the General Medical Council. He was of opinion that direct representation on the General Medical Council should be given, and also that representation should be accorded to unregistered practitioners coming on the register. His statement on this point was as follows:

"One hopes that the effect of prohibition would be to raise the standard of conduct all round. But the principle, I think, is a good one that control involves representation. I think, therefore, that direct representation on the General Medical Council of all dentists should be given. I believe that that principle is accepted by the General Medical Council and that they would be perfectly willing to have direct representation. I think it necessarily follows—and again I am expressing my view reluctantly—that those who are to be

put on a new register or a new portion of the existing register, must also have representation. I do not see how they can be controlled without representation; but I think it is absolutely necessary in the interests of those on the existing register, that it should be a minority representation, so that by no possible chance could it come about that, if a large number of unregistered persons were put on to the register, they should be in a position to dominate the dental representation on the General Medical Council. I think that would be intolerable to the existing registered dentists."

175. That opinion is much divided in the Association as to the body to govern the dental profession is also indicated by a copy of a resolution that has been sent to us from the Irish branch of the British Dental Association. The resolution is as follows:

"That the Irish Branch of the British Dental Association would not consider any new Legislation satisfactory, that did not include Administrative and Educational control of Dental affairs by the Dental Profession."

176. Mr. Butterfield, on behalf of the Incorporated Dental Society, desired that the General Medical Council should still control the dental profession, but that dentists should be represented on the Council. He desired that unregistered dentists admitted to the dental register should have separate representation, but whatever their numbers might be on a new dental register he thought that the present dentists who are Licentiates in Dental Surgery should be entitled to a majority of representatives.

177. Mr. Morris, on behalf of the Macdonald Manufacturing Company, Limited, wished that some sort of appeal should be instituted rendering it possible that a decision to strike a dentist off the dental register might be reviewed. He instanced advertising as a case in point, defending it on the ground that it "popularised" dentistry. He would regard a decision to strike a man off the dental register for having exceeded what might be regarded as legitimate advertising as a punishment out of all proportion to the offence. He favoured an intermediate course of fines, while reserving the right of final removal from the register subject to a court of appeal.

178. Mr. Sidney Webb expressed very strongly the opinion that a profession enjoying a legal monopoly must, in the public interest, give up any aspiration to completeness of professional self-government. In a memorandum submitted to us he stated:

"But if it is proposed actually to give a legal monopoly to the registered practitioners, it is plain that these practitioners cannot possibly be entrusted with the fixing of the conditions of entry into their own monopoly—cannot therefore be allowed to dictate the educational requirements or the length and expense of the professional training—cannot even be permitted to decide what is or is not within the etiquette of the profession, still less what unprofessional conduct shall condemn one of their number to be removed from the register." In evidence before us he favoured control of the dental profession by a Minister responsible to Parliament, assisted by one or more advisory councils which should represent the different branches of the dental profession and also the public interests.

179. It is noteworthy that in the British Dominions the dental profession controls dental matters, and we have reason to know that the attitude to be taken up by Great Britain at the present time is being regarded with great attention. It has been strongly expressed in an important memorandum received from one of the British Dominions that has been submitted to us confidentially from the Colonial Office that one of the disabilities that Great Britain is labouring under at the present moment is that "matters dental are not under dental control." and that it would promote imperial solidarity if dental matters were placed under the control of the Dental profession.

180. We have found it difficult to reconcile the different views that have been placed before us and to frame the constitution of a satisfactory body for the control of the dental profession. In this connection we have strongly in mind the probable constitution of the dentists' register after an Act prohibiting unregistered dental practice. **We are not in the present circumstances in favour of immediately severing the control of the dental profession from the General Medical Council.** We recommend that the control of the Dental Profession shall be kept within the orbit of the General Medical Council for the present but that as much self-government of the profession by dentists should be effected as is practicable and we are of opinion that the public should be represented on the controlling body by laymen.

181. With a view to securing control in the above sense we suggest that:

The control of the dental profession and the custody of the Register should be entrusted to a Statutory Board under the General Medical Council, of which the General Medical Council should appoint 3 of its own members, the registered dentists should elect 5 (3 for England and Wales, 1 for Scotland and 1 for Ireland), and 3 should be appointed by His Majesty in Council of whom 2 should be persons not upon the Medical or Dentists' Register.

Any person aggrieved by a decision of the Board to remove his name from the register should be entitled to apply to the General Medical Council for leave to appeal and, if leave is granted, the appeal should be heard by the General Medical Council.

The Dentists' Board should be empowered to frame rules regulating its own proceedings, but the rules so framed should be valid only if approved by the General Medical Council.

182. In recommending the formation of a Statutory Board under the General Medical Council we have not been unmindful of the fact, which we have referred to in a preceding paragraph, that in the present constitution of the General Medical Council there is no provision for the appointment to the Council of members representative of the dental profession.

183. The constitution of the General Medical Council is not within the terms of our reference, but we have assumed that after the resolution passed by the General Medical Council which is referred to in paragraph 167, early steps will be taken to secure that representatives of the dental profession shall sit on the General Medical Council. Such a course would be in harmony with our recommendations and it would seem natural under these circumstances that the six dental members of the Board should be made members of the Council.

184. We have considered very carefully whether it is desirable that licentiates in dental surgery and practitioners who have been or will be admitted to the register by virtue of being in practice should be separately represented on the Dental Board. We are strongly of opinion that after any Act prohibiting dental practice by unregistered persons has been passed, it is very desirable that the dental profession should not be regarded as sectional but as a whole. In view, however, of the representations that have been made to us by both the British Dental Association and the Incorporated Dental Society, we think that one, but not more than one, of the elected dentists for England and Wales should be a registered dentist whose admission to the register was in virtue of being in practice at the date of this report. The remaining dentists elected for England and Wales and the dentists elected for Scotland and Ireland should be Licentiates in Dental Surgery. We also recommend that if and as long as registered dentists admitted to the Dentists' Register by virtue of being in practice comprise a majority of registered dentists, one of the Crown nominees should be selected from their number to represent them.

185. We regard the Dental Board we have suggested as giving place in time to a Council or Board independent of the General Medical Council, and consisting of (1) Dentists elected by the profession, (2) Dentists appointed by the dental licensing bodies, and (3) Nominees of the Crown on the advice of a responsible Minister. The latter should include laymen.

We think that on a petition from registered dentists, of such a character as appears representative of the dental profession, it should be made lawful to establish such a Board or Council by Order in Council.

A notice of the Order—stating that the draft may be inspected by persons directly interested—should be published in the "London Gazette," and the Privy Council should consider any representations which may be made during a specified period.

The draft might then be laid before both Houses of Parliament, and if within a given time no address hostile thereto were adopted in either House the draft Order might be submitted to the King in Council.

Section XV.—Ethical Standard for Dentists.

186. In the course of our enquiry the question of the ethical standard that ought to be observed by dentists has frequently been mentioned.

187. The British Dental Association have a very high ethical standard for their members and do not permit any advertising. Some of the dental licensing bodies require applicants for their licence in dental surgery to give an undertaking that they will not advertise. The General Medical Council are not empowered to lay down ethical standards for the dental profession. The Council can only erase a dentist's name from the Dentists' Register under certain conditions. The function of the Council in this respect is regulated by Section 13 of the Dentists Act, 1878, which is in the following terms:

"Where a person registered in the Dentists' Register has, either before or after the passing of this Act, and either before or after he is so registered, been convicted either in Her Majesty's dominions or elsewhere of an offence which, if committed in England, would be a felony or misdemeanour, or been guilty of any infamous or disgraceful conduct in a professional respect, that person shall be liable to have his name erased from the Register.

"The General Council may, and upon the application of any of the medical authorities shall, cause inquiry to be made into the case of a person alleged to be liable to have his name erased under this section, and, on proof of such conviction or of such infamous or disgraceful conduct, shall cause the name of such person to be erased from the Register:

"Provided that the name of a person shall not be erased under this section on account of his adopting or refraining from adopting the practice of any particular theory of dentistry or dental surgery, nor on account of a conviction for a political offence out of Her Majesty's dominions nor on account of a conviction for an offence which, though within the provisions of this section, does not, either from the trivial nature of the offence or from the circumstances under which it was committed, disqualify a person for practising dentistry.

"Any name erased from the Register in pursuance of this section shall also be erased from the list of licentiates in dental surgery or dentistry of the medical authority of which such person is a licentiate."

188. The General Medical Council can erase the name of a dentist from the Dentists' Register for an offence committed before registration. Many unregistered practitioners whose names will be added to the Dentists' Register, if our recommendations are adopted, have, in the past, been guilty of conduct which the General Medical Council would probably regard as "infamous, or disgraceful conduct in a professional respect."

We recommend that the same standard of ethics should be observed in the dental profession as in the medical profession, but the General Medical Council should not erase the name of an unregistered practitioner added to the dentists' register for either advertising, canvassing, covering or any other purely professional offence which was committed before the practitioner was registered.

189. The position of an unregistered practitioner, as regards advertising, will be a somewhat difficult one on becoming a registered practitioner. The position of the General Medical Council as regards advertising was carefully explained to us by Sir Donald Macalister. A notice in the following terms has been sent by the Council to all registered dentists:

"That the issue of advertisements of an objectionable character, and especially of such as contain either claims of superiority over other practitioners, or depreciation of them, may easily be carried so far as to constitute infamous or disgraceful conduct in a professional respect."

190. Sir Donald further explained that advertising *qua* advertising is not objectionable in itself "unless it is carried to such lengths that it could properly be said to constitute conduct that is infamous or disgraceful."

191. The Council publish in the Dentists' Register a warning notice summarising the "Resolutions and Decisions of the Council upon forms of professional misconduct." The notice as regards advertising is as follows:

"5. Advertising and Canvassing.

The practices of (a) advertising by a registered medical practitioner with a view to his own gain, particularly if deprecatory of other practitioners, or of sanctioning such advertising, of (b) employing or sanctioning the employment of agents or canvassers for the purpose of procuring patients, and of (c) associating with or accepting employment under any Association which practises canvassing or advertising for the purposes of procuring patients, are in the opinion of the Council contrary to the public interest and discreditable to the profession of medicine, and any registered medical practitioner resorting to any of such practices renders himself liable on proof of the facts to have his name erased from the Medical Register."

192. The Council have hitherto not regarded all advertising as infamous or disgraceful conduct in a professional respect, and if it could be arranged that some guidance could be given as to what advertising is not infamous or disgraceful it would probably facilitate the administrative working of any Act prohibiting unregistered dental practice. The witnesses of the Incorporated Dental Society stated that they welcomed a strict ethical code, and were quite prepared to submit themselves to the jurisdiction of the General Medical Council. This particular society undertakes the approval of advertisements issued by its members, and if the Statutory Dental Board recommended by us could undertake a similar function for the dentists on the Dentists' Register when unregistered dental practice has been prohibited it might ease the transition from a free uncontrolled advertising licence to what will no doubt be a very strict professional control. The exercise of such a function even for a limited number of years would be valuable in assisting the formation of a desirable professional standard of conduct. In order to cover the expenses of the Statutory Dental Board a fee would have to be charged for every advertisement submitted for approval.

Section XVI.—Prohibition of Dental Practice by Unregistered Persons.

193. We have in a previous section expressed the opinion that very grave evils have been shown to result from the unrestricted practice of dentistry by unregistered practitioners. In this section we consider the question of the restriction of dental

practice by unregistered persons. The necessity in the public interests of some control or restriction being admitted, the question needs examination from two points of view, viz.:

- (1) Is it desirable that dental practice by unregistered persons should be permitted; if so, under what conditions?
- (2) Should dental practice by unregistered persons be entirely prohibited?

Nearly every witness has expressed the opinion that dental practice by unregistered persons should be absolutely prohibited, subject to existing unregistered practitioners being allowed under certain conditions to remain in practice. Witnesses have been pressed in examination to state whether it would not suffice for the protection of the public to place further restrictions on the titles which unregistered practitioners may use. The replies have almost invariably been to the effect that any attempt to control unregistered practice by a restriction of title would inevitably fail. Representatives of the registered dentists and unregistered practitioners were agreed that such a system could not be relied upon to protect the public interests. It was pointed out to us that in the Colonies dental legislation in the first instance had usually followed the precedent of the Dentists Act, 1878. This legislation having failed to protect the public, amending acts had been passed, based on the principle of control by restriction of title, but that these amending acts had proved to be unsatisfactory and that it had been found necessary, in the public interest, to pass acts prohibiting under penalty the practice of dentistry by unregistered persons.

194. Mr. Sidney Webb was opposed to the legal prohibition of unqualified practice mainly on the ground that it would result in a professional monopoly being created, which would not be in the public interest. We have considered most carefully the different representations which have been made to us and **we are of opinion that in the interests of the public, more especially that section of it which is usually described as the working classes, dental practice by unqualified persons should be prohibited under penalty and that nothing short of this is likely to prove efficient.** We are further of opinion that the most satisfactory way of distinguishing a qualified from an unqualified person is by the formation of a register of qualified persons. Unqualified persons should not be permitted to hold themselves out as willing to practise dentistry or perform dental operations.

195. No dental operation or the supply or fitting of artificial teeth should, in our opinion, be permitted except by a qualified person entered on a register of such persons. The only exception which we think it desirable to make is to permit the extraction of a tooth by an unqualified person on the representation of the person applying that he is suffering from toothache and also that there is no dentist or medical practitioner available within a reasonable distance. The fee to be charged for such an extraction should be limited to 1s., and no anæsthetic, either general or local, should be permitted. The disadvantages that have been suggested as likely to result from the prohibition of dentistry except by registered qualified persons are mainly concerned with:

- (1) Preventing a sudden shortage of dentists.
- (2) The provision of students in sufficient number for the dental schools to supply the adequate dental needs of the nation.
- (3) The charging of reasonable dentists' fees.
- (4) The provision of a public dental service.
- (5) The control of the profession.

We have made recommendations in other sections of the report which we think should safeguard the interests of the public in the above respects.

Section XVII.—Admission of Unregistered Practitioners to the Dental Register.

196. We have recommended in the previous section that unregistered dental practice should, in the public interest, be prohibited under penalty. The effect of an act giving legal effect to this recommendation would be to prevent all the present unregistered practitioners from continuing in practice. We do not think that such a course would be just or in the interests of the public. Many of the present unregistered practitioners have been in practice for a great number of years, they are held in public esteem in the districts in which they practise, they do not attract custom by objectionable advertising and many carry on their profession with an ethical exactitude hardly differing from that of the registered dentist. It is not the unregistered practitioners who fulfil these conditions who are a menace to the public, and the Committee would regard it as not in the public interest to prohibit them from continuing to practise.

197. Existing unregistered practitioners have, moreover, established their practices within the law, which does not prevent them practising dentistry or announcing to the public that they do so. They have acquired a vested interest and established a goodwill in the businesses which they have created. We have received statements and heard witnesses from bodies of unregistered dental practitioners, and we quote the three extracts below as best setting out the claims of unregistered practitioners to continue in practice.

198. The Incorporated Dental Society, Ltd., stated:

“The legal position, therefore, is that an Unregistered person has:

“(1) An absolute right to practise dentistry.

“(2) Is entitled to notify the public that he follows that calling and to take such descriptions of himself or his work as do not amount to an assertion or implication that he had a hallmark in the shape of a degree or diploma which would entitle him to be registered under the Dentists’ Act, 1878.

“(3) That he is entitled to sue for materials supplied and work done to the patients’ mouths, and

“(4) That although he cannot sue in the Law Courts for fees for dental operations and advice, he is entitled to receive from his patients fees for so doing—much in the same way as a Barrister although he cannot sue for his fees is entitled to receive a honorarium for services rendered.

“It is, therefore, claimed that the unregistered practitioner has a vested right of practice. Upon the faith of this vested right the members of the Incorporated Dental Society have invested money in their practices, spent years in equipping themselves to carry out their professional duties to the satisfaction and benefit of their patients, and devoted in many cases the best years of their lives to dental work. It is submitted that it would be a grievous injustice to them if they were hampered or interfered with in their practices and prevented from reaping the benefit of many years of hard work.”

199. The Chemists’ Dental Society of Great Britain and Ireland stated:

“Dentistry has been practised by chemists from time immemorial. Dental operations were performed by them and recognised as their proper work, long before dentistry became a separate specialised profession, and many chemists have continued so to practise down to the present time. Their position relative to dentistry has never been interfered with by statute, and seeing that they have never desired the distinctive title of “dentists” they were not as a body affected by the Act of 1878. They have gone on since the Act just as they did before, except that as dentistry has become more highly specialised, fewer

chemists in proportion have devoted themselves to it. But in thickly populated industrial areas where registered dentists are few and their fees prove prohibitive to the poorer classes, a greater call has been made on the dental service of chemists, wherein they have rendered useful and efficient public service. In higher class residential districts, where registered men were found more plentifully, the need has not been so great, and chemists have not taken up dental work so largely."

200. The Dental Society of Ireland stated:

"We are legally established in this business (*see* decisions below), therefore it would be unjust to put us out of a business we had sunk capital in and developed, a thing which Parliament never contemplated or does, always respecting the rights of those in any business who are legally engaged in same. For instance, the spirit trade, when compensation has always been insisted on.

* * * * *

"You will see from above that we are perfectly within our rights in practising dentistry, and that we are asking nothing amiss in asking not to be deprived of these rights, and that if an Act is passed we will get the same recognition and legal status as others."

201. In many parts of the country to prevent unregistered practitioners continuing in practice would be to deprive the public of the only practitioners in the locality practising dentistry, and the shortage of dentists in such areas would produce an intolerable situation.

The Committee are of opinion that if dental practice by unregistered persons is prohibited the existing rights of unregistered practitioners should be preserved by adding the names of persons practising dentistry to the dental register under specified conditions, who upon being admitted to the register shall acquire and enjoy the same legal rights, privileges and status as are conferred by the Dentists Act, 1878, on dentists registered under that Act and shall be entitled to sue for and recover any fee or charge in any court for the performance of any dental operation or for any dental attendance or advice or for any work done or material supplied. We only wish to qualify this with the statement that a reasonable measure of precaution shall be adopted to ensure that any person whose name is added to the register was in *bonâ fide* dental practice before the date of this report, that this practice formed his means of livelihood and that he can be trusted safely to practise dentistry upon the public.

202. We have received a considerable amount of evidence that every unregistered practitioner should have to pass an examination test before being admitted to the dental register. Sir Donald Macalister was of this opinion. The examination that has been suggested is one that will satisfy a body of examiners that the practitioner is a "safe" man to practise dentistry. Some witnesses representing the registered dentists would be satisfied if an examination test was only applied to those unregistered practitioners who had not been in practice for a period of 5 years.

Mr. Norman Bennett, on behalf of the British Dental Association was prepared, if unregistered dental practice was prohibited in the future, to admit existing unregistered practitioners, without an examination test provided they had been in *bonâ fide* dental practice for a period of 5 years. We quite appreciate the importance of not admitting to a register any person who is not a "safe" practitioner, but there would be considerable difficulty in examining all unregistered practitioners, many of whom are elderly men who have been in practice the better portion of their lives. The Committee are of opinion that a practitioner who has been in practice for a period of 5 years has established a vested interest which combined

with the fact that he evidently has satisfied the public in his practice to the extent that he is able to make a livelihood constitutes a presumption that he meets a public need and may be entrusted to continue his practice. **The Committee are of opinion that any unregistered practitioner or dental assistant who has been engaged continuously in the practice of dentistry by performing dental operations within the mouth for the period of 5 years immediately before the date of this report should be entitled to have his name entered on the dental register on payment of the fee for registration to the General Medical Council.** The applicant should satisfy a competent authority that he has been in practice for the period named, that such practice was his main professional occupation and produce such evidence as to character as may be required. We are aware that possibly a number of not very competent practitioners may obtain registration, but, apart from the difficulty of examining every unregistered practitioner, the Committee are of opinion that a vested interest of 5 years' professional work constitutes a valid claim to be allowed to continue his profession if his character be satisfactory.

203. **Unregistered practitioners in dentistry or dental assistants who have been practising dentistry by operations on the mouth for a period of less than 5 years before the date of this report should produce evidence that they have been in dental practice and any evidence as to character that may be required. They should further be required, within a period of 2 years, to satisfy a test of their competence to practise. On satisfying such test their names should be added to the dental register on payment of the usual registration fee.** The test which we have in mind is an examination founded on the practical everyday work of a dentist in ordinary practice. The examination should be a practical and oral one conducted by two examiners. The candidate's name should be unknown to the examiners.

204. We have carefully considered the nature of the authority which should have the administrative duty of deciding which unregistered dentists fulfil the required conditions for registration. We consider that an *ad hoc* committee of 7, four members of whom (including the Chairman) are nominated by the Lord President of the Council and three by the General Medical Council would be satisfactory. The Chairman of the Committee should be a layman and the secretary should be nominated by the Lord President of the Council after consultation with the Chairman. The regulations governing the procedure of the Committee should also be subject to the approval of the Lord President of the Council. The expenses of the Committee should be paid out of a fixed fee to be charged to all applicants for registration. A second fee should be payable to cover the cost of examination by applicants requiring to pass this test. We wish to emphasise very strongly that every endeavour should be made to choose a committee which will have the confidence of unregistered practitioners.

205. Each application to the Committee should be made individually, but we believe that the Committee would be able to lessen its labours without sacrificing the public interest by giving careful consideration to the documents and other evidence placed before us by the Incorporated Dental Society, Ltd. If the Committee should then be satisfied that the conditions required to be fulfilled by unregistered practitioners before admission as members of this society afford a reasonable equivalent for the inquiries and examination that would be conducted by the Committee we think that an applicant who claims to be a member of this society should be admitted to the dental register on furnishing proof that he was admitted as a member of the society twelve months before the date of this report. After consideration of the documents and evidence submitted to us we do not think that any other society of unregistered practitioners has established a claim for special consideration.

206. We have received statements and heard witnesses from societies representing pharmaceutical chemists and chemists and druggists who practise dentistry. The Committee do not think that it is altogether desirable for one person to practise two professions unless there is some special public advantage. It has long been the custom of many pharmacists to practise dentistry, and frequently it forms but a small portion of their business, being in the nature of a "side line." Chemists who are at the present time unregistered practitioners of dentistry should, we think, be dealt with somewhat exceptionally, and those chemists who may be admitted to the dental register should within a period of 5 years from registration elect which profession they intend to follow and give an undertaking to the General Medical Council that they will not concurrently practise both the profession of dentist and pharmacist. Any failure to keep this undertaking should involve risk of removal from the dental register. We have recommended that for an unregistered dental practitioner to be admitted to the dental register he should satisfy a committee that dentistry was his main professional occupation. As regards unregistered persons practising dentistry whose names are included either in the register of pharmaceutical chemists or in the register of chemists and druggists published by the Pharmaceutical Society of Great Britain, we think in the special circumstances of their case it would be sufficient that an applicant should satisfy the Committee that his practice of dentistry was a substantial one and included all usual dental operations. We think that pharmacists would be suitable persons to undertake in districts where no registered dentist is available the strictly limited dental practice by unregistered persons which we have suggested in the previous section.

Section XVIII.—Form of Dentists' Register and Title to be conferred by registration.

207. We have received a considerable amount of evidence as to the form the Dentists' Register shall take if unregistered practitioners are admitted to the register as a condition of the prohibition of unregistered dental practice.

Some of us have been somewhat at a loss to understand why so much importance is attached to the form of register in which is recorded the names of registered practitioners. Provided the register enables any person consulting it to ascertain the dental qualifications which each person whose name is recorded therein holds, we think that all practical purposes will be served.

208. Proposals were placed before us by the General Medical Council and the British Dental Association that the names of unregistered practitioners should be entered in a separate register or roll. We were informed by Sir Donald Macalister that the Council had experienced great difficulty, following the formation of the Dentists' Register after the Dentists Act, 1878, in establishing a suitable ethical standard for the unregistered practitioners admitted to the register. He feared similar difficulty might arise again. The Council proposed that a system of annual licences should be substituted for a life registration for unregistered practitioners admitted to the register. We do not, however, recommend annual licensing, but think that in future there should be one dental profession, all members of which were subject to the same control.

We have very carefully considered different suggested forms of register, and we recommend that the present form of register shall be adopted with the addition of a fifth column in which shall be recorded the qualification for registration of unregistered practitioners who may be admitted to the dentists' register through being in practice at the date of our report. We suggest the description "In practice ."

209. As regards the title which registration should confer we think that every registered practitioner should be entitled to describe himself as "Dentist" or

"Dental Practitioner," the two titles specifically mentioned in the Dentists Act, 1878. Mr. Norman Bennett informed us that many of the present registered practitioners would regard it as inequitable if their exclusive right to the title dentist in virtue of the Dentists Act, 1878, was taken away, and the at present unregistered practitioners were allowed to use it, therefore, to grant the title of "dentist" to the unregistered would be a great concession. He added, however, that a person on a register must have some title or other, and he could suggest nothing but the dictionary word "dentist," and he could not oppose this title.

210. While agreeing that all registered practitioners should be entitled to use the titles named we are of opinion that no other letters or titles of any kind should be used by a registered practitioner except titles registrable in Great Britain, or letters purporting to represent them, describing or arising out of any diploma, degree, or licence he may have received from a dental licensing body or from a medical licensing body and which constitutes a title for registration.*

Section XIX.—Legislation to prevent Dental Practice by Unregistered Persons.

211. There are two precedents which we have consulted when considering what legislation would be appropriate for the prevention of dental practice by unregistered persons:

- (1) The Midwives Act, 1902.
- (2) The Venereal Disease Act, 1917.

The Midwives Act prohibits from a certain date any woman "habitually and for gain attending women in childbirth . . . unless she is certified under the Act."

Local administration of the Act is entrusted to County Councils and County Borough Councils who are specially designated as local supervising authorities, and who may institute prosecutions for offences punishable on summary conviction under the Act.

212. The Venereal Disease Act, 1917, prohibits any person, unless he is a duly qualified medical practitioner, from treating, for reward either direct or indirect, any person for venereal disease. The prohibition only operates in areas to which the particular section of the Act has been applied by order of the Local Government Board, or in Scotland and Ireland by the Local Government Boards for Scotland and Ireland respectively. There is a proviso in the Act that before an order shall be made in respect of any area a scheme for the gratuitous treatment of persons in the area suffering from venereal disease shall have been approved by the Local Government Board and be already in operation.

213. We do not think either of these precedents quite suitable for the prohibition of dental practice. The Venereal Disease Act, 1917, which is a very recent precedent, had not to deal with the problem of the admission of a number of practitioners to the medical register. The Midwives Act, 1902, had to provide for the admission of a number of practising midwives on to the "roll" created by the Act. The Act entrusted the local supervising authority with the investigation of charges against midwives. We do not think local authorities should have similar powers with respect to registered dentists. We suggest that total prohibition of unregistered dental practice, with the exception we have mentioned elsewhere, should come into force in England and Wales, Scotland, and Ireland one year after the date of the passing of the Act, but that the Lord President of the Council, if he thinks fit and after consultation with the Local Government Board, or for

* This obviously would not prevent a man from adopting such a practice as printing on his notepaper the name of any professional society or association to which he belongs.

Scotland or Ireland the Local Government Boards of Scotland or Ireland, respectively, and the Dental Board should have the power to advise the suspension by Order in Council of the operation of the Act for a further period of 2 years in England and Wales, Scotland, or Ireland, respectively. After the expiration of 3 years the Act should apply universally in the whole of the United Kingdom. During the year between the passing of the Act and its coming into operation those unregistered practitioners in practice at the date of our report should have an opportunity of seeking registration under the conditions we have suggested elsewhere.

Section 3 of the Venereal Disease Act constitutes a suitable penalty clause for inclusion in any bill for the prevention of unregistered dental practice.

214. We think that dental mechanics who have been acting as dental mechanics for a term of 5 years before the date of our report should be given an opportunity of passing a practical examination in dental mechanics during the period of two years and that the names of those who pass the test should be entered on a roll with a view to their being afforded an opportunity of undergoing a modified dental curriculum extending over two years, and which might be taken during any period within 10 years of the passing of the Act. Any scholarships awarded to dental mechanics during the 10 years following the operation of the Act should be confined to dental mechanics on this roll.

Section XX.—Dentists' Fees.

215. The question of the fees charged by dentists has frequently come before us. Mr. Robinson, the Solicitor of the Incorporated Dental Society, expressed the opinion that if the dentists' profession was made a "close" profession, it was desirable in the public interest that a scale of fees should be fixed. Mr. Sidney Webb also stated strongly the view that no profession which has a monopoly and which depends upon fees for its remuneration could be trusted with the opportunity of charging whatever it chooses. Conservative dentistry is time-consuming, and we fear that any reasonable scale of fees that might be suggested would place treatment outside the resources of the majority of the inhabitants. It would, moreover, be very difficult to fix a scale of fees, as circumstances of each individual case vary so much. We have gathered from Mr. Norman Bennett that it is the practice of the dental profession, like the medical profession, to grade charges to a great extent according to the means of the patients. We do not think there would be advantage in attempting to fix a scale of fees for the different dental operations, but rather that public dental services shall be established. These will in themselves prevent fees rising unduly while placing at the disposal of the inhabitants a preventive service of dentistry.

Section XXI.—Scholarships for Dental Students.

216. In the section dealing with the causes of the shortage of registered dentists we have expressed the opinion that a system of scholarships for dental students is desirable. In the present section we state our views on this subject in somewhat fuller detail.

The dental schools for the instruction and training of dental students have attached to them very few scholarships. In this respect they compare very unfavourably with the schools of the sister profession of medicine. The result is that it is rare for a lad, the son of humble parents in life, to enter on a course of training for a licentiate in dental surgery. We think that this is greatly to be deprecated, and that the profession of dentistry is the poorer in consequence. During the course of the next few years, probably for the next decade, we think it will be necessary to supplement the usual channels of recruitment of the dental

profession by the aid of a considerable number of scholarships which should be of a value sufficient to cover all fees and provide for maintenance.

217. In this connection we wish to refer to evidence given by Mr. Norman Bennett on behalf of the British Dental Association, and by Mr. Butterfield on behalf of the Incorporated Dental Society. Both these bodies were in favour of registered dentists paying an annual licence of from £3 to £5 per annum, the proceeds being devoted to aiding dental education and research. The Incorporated Dental Society desired that the proceeds should be used for bursaries for pupils of poor parents and for research; Mr. Sidney Webb and Mr. Anderson, M.P., regarded a system of State scholarships as absolutely essential to maintain an adequate number of recruits for an increased dental profession. The former placed the number required at 500 per annum. Mr. Anderson, though not dissenting from this figure, contemplated a smaller number to commence with. In connection with scholarships the Committee wish to refer to the position of dental mechanics. A dental mechanic performs mechanical work for a dentist, *e.g.*, the manufacture of dentures, &c., but does not perform either dental operations, or come into personal contact with the patient. Our evidence is conclusive that many of the most reputable and experienced unregistered practitioners were dental mechanics originally, and the Incorporated Dental Society submitted evidence to the effect that dental mechanics of a certain number of years' standing should, in the event of unregistered dental practice being prohibited, be admitted to the dental register without a course of training, and on passing an examination test.

218. Colonel Waring, F.R.C.S., M.S., Chairman of the Court of Examiners, and Mr. F. G. Hallett, Director of Examinations, witnesses representing the Royal College of Surgeons of England, stated that after dental practice by unregistered persons had been prohibited they were of opinion that the Royal College would be prepared to grant their Licence in Dental Surgery to dental mechanics of a certain number of years' standing before the issue of our report, after an approved two years' course at a hospital and dental school, and after passing the 1st and 2nd professional examination of the College. The College did not propose in the case of dental mechanics to insist on a preliminary examination or a qualification in chemistry and physics. A large number of dental mechanics have remained loyal to their employers, and have not attempted to set up as unregistered practitioners, which it has been stated to us many of them might have done. The proposal made by the representatives of the Royal College was to be a strictly temporary one. The main difficulty that the Committee anticipates is that a dental mechanic, who may be a married man with a young family, will be unable to maintain himself and family while undergoing the two years' course contemplated. The Committee, however, think that the proposal of the British Dental Association and of the Incorporated Dental Society, that after the passing of an Act prohibiting unregistered dental practice, persons admitted to the dental register shall pay an annual licence fee in order to retain their names on the register, is one that has much to recommend it; but they think that a person admitted with a registrable qualification after instruction and examination should not be liable to pay the annual licensing fee until the lapse of 5 years after registration. The first few years after registration are frequently a period of financial stringency for the newly qualified. Unregistered practitioners admitted to the register without examination, having been in practice for a number of years, might pay an annual licence fee from the time of admission. We are of opinion that the proceeds of annual licences should be shared equally between dental education and research, after payment of the expenses of the Statutory Dental Board.

219. In view of the urgent necessity of rapidly increasing the supply of dentists the moiety earmarked for education should be mainly expended during the next few years in providing scholarships for dental mechanics. The scholarship should pro-

vide for the payment of all school, hospital and examination fees with an adequate maintenance allowance depending on the circumstances of the individual scholarship holder. We think that the modified Statutory Dental Board of the General Medical Council suggested elsewhere would be an appropriate body to administer the licence fund. The regulations governing the administration of the licence fund should require the approval of the Lord President of the Council.

220. A scheme of scholarships awarded from the licence fund would tend to reduce the shortage of dentists. It would operate quickly, and has much to recommend it; but it would only be a temporary measure put into operation owing to the quite exceptional position of the moment, and the Committee are not prepared to recommend it as a permanent method of recruiting a portion of the dental profession. The number of dental mechanics entering the dental profession by scholarships will not be sufficient to meet the needs of the case, and the Committee are of opinion that a number of scholarships should be provided by the State to enable scholars (boys and girls) from secondary schools to take up the dental profession. They urge that it would be wise economy on behalf of the State to make such scholarships available for a considerable period of years to a very large proportion of students entering upon professional studies, and that subject to suitable conditions being laid down by the Board of Education this proportion should reach one-half for the next five years. The scholarships should be sufficient to pay all necessary fees both for instruction and examination, together with an adequate maintenance grant. In view of the importance of elementary science the Committee think there would be advantage in scholarships only being awarded to scholars who had attended satisfactory courses of study in science with appropriate practical work in a laboratory. The course of study in elementary science should approximate to that suggested by the Board of Education as leading up to the 2nd school examination and should include some knowledge of biology. The scholarships should be awarded at the age of 17 or 18, to enable a student to complete his dental education on reaching the age of 21, the statutory age for registration of a dentist.

Section XXII.—Dental Research.

221. The importance of dental research has been brought before us on several occasions. We have already expressed our approval of the proposals of the British Dental Association and the Incorporated Dental Society that registered dentists should pay an annual licence, a proportion of the proceeds of which should be devoted to advancing dental research and the education of the dental profession. Mr. Norman Bennett in making the suggestion to us stated as follows:

“A comparatively small amount of money spent in research work might result in discoveries in connection with dental pathology of such importance that the amount of clinical and operative work remaining to be done would be very much reduced. I regard this matter of an annual tax on the profession, to be devoted to education and research, as one of the most important parts of the whole problem.”

222. Dr. Robertson also attached great importance to research work, and favoured a comprehensive inquiry on the causes of dental caries and the effect on health. He stated:

“I have thought a great deal about the question of dental caries; as to our knowledge of the origin and causation of it, and how much we want yet to learn as to the causes of dental caries. Because at the present time there are many differences of opinion as to the influences producing it, and I cannot help thinking that evidence is available if one takes a wide enough purview of the subject, and that some departmental committee or research committee needs to be appointed to investigate the subject from a very large point of view. As a matter of fact, I am a member of a small committee appointed by the Society

of Medical Officers of Health to suggest subjects to the National Research Committee, and this was one subject that we had in view immediately after the war passes. They are engaged largely in war work just now, but as soon as the war is over, we are going to ask that the National Insurance Research Committee shall make an investigation into dental caries of a sufficiently wide character. It means large areas in this country and very exact observation, and areas abroad as well, in different countries, under different feeding conditions."

Dr. Wheatley expressed the opinion that whatever investigation and research may be necessary for ascertaining the causes of dental caries should be immediately made the business of the Government.

223. We are very strongly of opinion that a thorough investigation into the causes and effects of dental caries and other diseases of dental origin is long overdue. It is obvious that any research which resulted in dental caries being prevented either wholly or in part would relieve humanity of an immense amount of pain and subsequent ill health. The investigation should be conducted by the Medical Research Committee who recognise the work as part of their functions and included it in their first programme of work. They have made some progress with it already in spite of war difficulties and we are confident that they are fully alive to the importance of the question.

Side by side with researches on the medical aspect of the problem should go research as to all that pertains to the technique of the profession. We suggest that the Dental Board strengthened possibly by some *ad hoc* representatives added for research purposes only, should conduct researches of this nature.

Section XXIII.—Aid to Dental Schools.

224. Our attention has been directed to the difficulty in which teaching is carried on at dental schools and to the different financial position they are in as compared with the medical schools. It is to the financial advantage of a doctor to teach in a medical school attached to a hospital. The students when they enter general practice, send patients to their old teachers, as consultants. In dental practice consultative practice hardly exists, and we were informed that it does not pay a dentist to teach in a hospital. Mr. Norman Bennett, in placing before us the proposal that an annual licence should be paid by all registered dentists and partly allocated to education stated:

"I do not think it is generally understood under what grave difficulties dental education is carried on at the present time. For instance, at the Royal Dental Hospital, to which I am attached, part of the students' fees for teaching have actually to go to the upkeep of the hospital and the teachers are practically unpaid. That applies more or less to most of the dental schools. The teaching is carried on as it were *con amore* by those who have an interest in the subject. In America it is utterly different. Now, teaching to be properly done has to be properly paid for. Young men acting as whole-time teachers who were properly paid, could do an immense deal to improve the standards of dental education at the present time. Much has been done by those in the past and those in the present, but nothing compared with what could be done if the means were provided for it, and I say that if the means were provided for that purpose by the dental profession no criticism would hold against it."

225. We think that the proposal of the dental profession to tax itself so as to place dental education on a more satisfactory basis is a proposal that is greatly to the credit of the profession, and we do not wish to express any disapproval, but we understand that the Board of Education already makes grants to medical and certain provincial dental schools of university standing, and we think those grants

might be extended in the light of the peculiar difficulties under which dental schools labour.

Section XXIV.—Education of the Public in the Need for Dental Treatment.

226. We have had the most striking unanimity in all the evidence we have heard from both registered and unregistered practitioners as to the failure of the population to regard dental disease and its effect on health as in any way a serious matter. The idea that the teeth are a portion of the human body which when they are diseased need treatment is quite foreign to all accepted notions. Disease is allowed to progress until it becomes incurable and the teeth have to be removed. Again and again we have had evidence that people will not bother to have their teeth stopped when disease first appears, but let them rot and decay until pain drives them to the dentist for extractions. The responsibility for this has largely rested with parents in the past, as they have exercised practically no oversight over the health of their children's teeth. During the last 10 years various organisations have been established through which in our opinion it may be possible to affect very materially the health of the nation by a properly directed educational propaganda designed to impress upon people the importance of looking after their own and their children's teeth.

227. *Health Visitors.*—Health visitors might be instructed in the evil results to health which follow in the train of neglected teeth. At her visits to the homes of children a health visitor has a unique opportunity of impressing on mothers the grave injury resulting from neglect of decayed teeth. Carefully worded leaflets, preferably illustrated, might be distributed. Advice is much more likely to be followed if there exist in the district dental services (maternity, school, and general) at which treatment can be obtained.

228. *School Agencies.*—Opportunities exist in great measure in the school services for extremely useful educational propaganda work. The teachers, attendance officers, school nurses, and the school dentists themselves can all do most useful work in educating the public and the children on the subject.

229. *Welfare Supervisors.*—Women suffer more from decayed teeth than men, and welfare supervisors have it in their power to persuade many girls and young women to have their teeth attended to. They will have the satisfaction of knowing that they are saving many women years of chronic ill health and suffering in later life.

230. *Insurance Societies.*—In their own pecuniary interest quite as much as in that of their members, insurance societies should neglect no opportunity of impressing the importance of a healthy set of teeth and the evil results following neglect. From the evidence submitted to us it is clear that a society that took effective steps to ensure that the teeth of its members were properly attended to on admission to the society and, when needed, afterwards would experience the benefit resulting from the improved average standard of health which its members would enjoy. As far as we are in position to see there is no one factor within the control of insurance societies which will repay them so well as to concentrate on the teeth of their members. The health insurance organisations of different kinds by advocating locally the establishment of public dental services will be aiding the creation of machinery by which sickness will be diminished. When a dental service is set up an insurance society should never neglect to advise its members to avail themselves of its use. Perhaps of all bodies insurance societies have most to gain by the establishment of efficient dental services.

231. *School Dental Certificates.*—We wish to suggest that in a few years, when school dental treatment of children leaving school is in effective operation, and public dental services are in existence, the question of school dental certificates

shall be considered. We have in mind the issue to each child or young person leaving school of a certificate signed by the dentist giving a graph of the dentures and stating that the teeth have been examined and placed in a state of preservation. There should be an instruction on the certificate advising the holder to have his teeth inspected annually by a private dentist or at the public dental service and spaces should be available for a record of such examinations.

Such certificates might be of great practical use, and be made the basis of a definite continuous oversight of the health of the teeth of the people. Labour exchanges, employers of labour, insurance societies, doctors, or anyone who was interested in preserving the health of an individual, would have available the means of bringing home to that individual the importance of teeth preservation.

232. *Medical Practitioners.*—It is the professional duty of a doctor to do everything within his skill for his patient. We have had suggestions that doctors sometimes have failed to impress upon their patients the importance of going to a dentist when this is an essential part of the permanent cure of his illness. We were informed by Sir Donald Macalister that it is becoming more frequent for doctors to advise such preventive treatment than it used to be. We wish to recall to the medical profession the great opportunities which frequently come their way of advising with authority the necessity of preventive dental treatment.

233. *A Public Dental Service.*—Perhaps the best educator of the public in dental matters is an efficient dental clinic. The presence of the means of treatment, always available, produces a definite effect on the public. The preventive side of dental treatment becomes emphasised directly a public authority considers it its duty to provide treatment. The instruction and advice given at such a clinic spreads throughout the area served, and knowledge of the ill effects of teeth neglect replaces ignorance. In a town properly served with a live dental clinic any inhabitant noticing the onset of dental decay would know it was to his interest to have it at once attended to.

234. *The Press.*—It is strange that, whereas articles in the public Press frequently deal with disease and its prevention, and instruct the public in adequate measures of precaution, it is rare indeed to find the importance from a health point of view of the preservation of the teeth alluded to. We can only believe that this is due to our masters themselves being unaware of the disastrous effects on the public health of national teeth neglect. With the hint conveyed in this paragraph we trust they will not fail on suitable occasions to point the moral which this report endeavours to teach.

Section XXV.—Miscellaneous.

RESERVATION FOR MEMBERS OF HIS MAJESTY'S FORCES.

235. The effect of the war as a disturbing factor in carrying out the recommendations we have made has received our close attention. We have received many letters on the subject from members of His Majesty's forces themselves and persons interested in such members. We should be the last to wish that any person who would have benefited from any of our recommendations, had he remained a civilian during the course of the war, would be in a worse position through having served His Majesty. We wish, therefore, to add to our recommendations the following general reservation safeguarding such interests.

We recommend that a general dispensing power shall be given to any statutory committee that may be set up to admit unregistered dental practitioners to the dental register to waive the observance of any statutory requirements on such conditions as they may consider desirable if they are satisfied that service &c. in His Majesty's forces has contributed to the non-

observance of any such requirement and that the safety of the public would not be jeopardised.

RECIPROCITY AND DENTAL DIPLOMAS GRANTED ABROAD.

236. Our attention has been directed to the provision made in the Medical Act, 1886, that in the case of the recognition for registration in the United Kingdom of medical diplomas granted outside the United Kingdom, such recognition must be reciprocal. Such recognition abroad of diplomas granted in the United Kingdom is thus a condition precedent to admitting diplomas acquired abroad as a qualification for admission to the Medical Register. There is no similar provision in the earlier Dentists Act, 1878, and we think it would be well to provide for reciprocity provisions, which should, however, only apply to persons holding diplomas obtained by examination from a licensing body.

SUMMARY OF THE PRINCIPAL RECOMMENDATIONS.

1. We are agreed that very grave evils are associated with the practice of dentistry and dental surgery by persons not qualified under the Dentists Act. These evils are largely responsible for: § 51

- (a) Lowering the social status and public esteem of the dental profession.
- (b) A great shortage of registered dentists owing to the unattractiveness of the profession.
- (c) Inability by the general public to distinguish between a registered and unregistered practitioner.
- (d) The dental treatment of the public being largely in the hands of uneducated, untrained and unskilled persons.
- (e) Grave personal injury owing to lack of skill and of technical knowledge.
- (f) Extractions of sound and only slightly decayed teeth.
- (g) Application of artificial teeth over decayed stumps and into septic mouths.
- (h) The existence in the public mind of the belief that there is no advantage in preserving the natural teeth, and that the correct thing is to let these decay and when trouble arises have all the teeth out and substitute a plate of false ones.

2. We are agreed that there was a great shortage of registered dentists before the war which has been intensified since. This shortage is mainly responsible for the following results: § 89

- (i) Registered practitioners are very unevenly distributed in the different countries of the United Kingdom, and also in the different parts of each country.
- (ii) The Registered Practitioner mainly attends to the dental needs of the upper and middle classes, the artisan and working classes in the bulk receiving very little treatment from the registered dentist.
- (iii) The dental needs of the population do not determine where the registered dentist practises.
- (iv) The registered dentist tends to gravitate to the centres of populous towns and to smaller towns, where high fees are obtainable or lucrative practice probable.

3. The causes of the shortage of Registered Dentists are mainly three: § 94

- (i) The present unsatisfactory state of the law in allowing the practice of dentistry by unregistered persons who have not qualified for the profession by a prescribed course of instruction, training and examination.
- (ii) The present length of the minimum course of instruction and training for dental students.
- (iii) The present expense of training at a dental school.

4. With a view to providing a sufficient supply of dentists and meeting the needs of the public arising from the shortage of dentists we recommend as means which are essential for meeting present evils:

- (i) An alteration of the law so as to secure the prohibition of the practice of dentistry by persons not registered. § 194
- (ii) The registration under certain conditions of unregistered practitioners practising dentistry at the date of our report. §§ 201-203
- (iii) A reduction in the minimum time required to be spent by dental students to acquire a qualification in dental surgery. § 156
- (iv) The provision of dental treatment for expectant mothers and children under the age of 5 years. §§ 99, 137
- (v) The completion as rapidly as practicable of an adequate system of school dental treatment. §§ 116, 138, 140
- (vi) The establishment of a public dental service. § 142
- (vii) The employment of dental dressers or assistants acting under the supervision of registered dentists in school and public dental services. §§ 120, 145
- (viii) The establishment of a system of scholarships for dental students with adequate maintenance grants. §§ 216, 220
- (ix) The registration after a short course of study and examination of dental mechanics employed as such during 5 years before the date of our report. §§ 162, 218
- (x) Scholarships for dental mechanics. § 219
- (xi) Increased grants to dental schools. § 225

5. We recommend that a special committee shall be appointed to admit unregistered practitioners, in practice at the date of our report, to registration as dentists subject to certain conditions being fulfilled. § 204

6. A thorough research investigation into the causes and effect on health of dental caries is needed. § 223

7. A Statutory Dental Board under the General Medical Council should be set up for the government of the dental profession. The Board shall consist of persons, including laymen, appointed by His Majesty in Council, dentists elected by the Dental Profession, and representatives of the General Medical Council. §§ 180, 181

8. We recommend that an annual licence fee of £5 shall be paid by registered dental practitioners, to be administered by the Statutory Dental Board, and to be devoted to— §§ 217-220

- i. The expenses of the Statutory Dental Board.
- ii. The provision of scholarships for dental students and during the next 10 years for dental mechanics.
- iii. Aid to dental schools.
- iv. Dental research.

9. We recommend that the practice of dentistry by public companies shall be subject to special control, provision being made to meet the case of existing companies. § 29

10. We recommend that an additional column shall be added to the Dentists' Register for recording the qualification for registration of unregistered practitioners admitted to the Dentists' Register. § 208

11. We recommend that unregistered practitioners admitted to the Dentists' Register shall use the title "dentist" or "dental practitioner," but no other title. Unregistered practitioners on admission to the dentists' register shall acquire the same legal rights, privileges, and status as are conferred by the Dentists Act, 1878, upon dentists. § 210

12. We recommend that action be taken to safeguard the interest of any member of His Majesty's forces who was, before joining the forces, an unregistered dental practitioner or assistant practitioner or dental mechanic. §235

CONCLUSION.

In conclusion, we wish to state very strongly that, in our opinion, the State cannot afford to allow the health of the workers of the nation to be continuously undermined by dental neglect. Steps should be taken without delay to recognize dentistry as one of the chief, if not the chief, means for preventing ill-health, and every possible means should be employed for enlightening the public as to the need for conservative treatment of diseased teeth. The dental profession should be regarded as one of the outposts of preventive medicine, and as such encouraged and assisted by the State. Treatment should be rendered available for all needing it. The present anomalous position in which an uneducated, untrained person can practise as a dentist, performing surgical operations on the teeth and jaws, doing untold damage and casting undeserved odium and dishonour on a scientific profession is intolerable, and should be dealt with immediately.

We desire to record our very great appreciation of the work of our Secretary Mr. F. H. O. Jerram, M.B.E. He has shown administrative capacity and a most intimate and exact knowledge of the subject of our reference. He has been of the greatest possible assistance to us throughout our deliberations, and more particularly in drafting our Report; and has shown most unusual capacity both in grasping the principles and in dealing with the great masses of detail which have come before us in the course of our work.

We have the honour to be,

Your Lordship's obedient Servants,

FRANCIS D. ACLAND, *Chairman*.

GEO. P. BLIZARD.

W. F. BOWEN.

W. H. DOLAMORE.

ALMERIC FITZROY.

KNUTSFORD.

FRANCIS W. LOWE.

GEORGE NEWMAN.

ARTHUR NEWSHOLME.

CHARLES S. TOMES.

F. H. O. JERRAM, *Secretary*.

February 5th, 1919.

APPENDIX.

Names and Qualifications of Witnesses heard by the Committee.

ANDERSON, W. C., M.P.

BARWISE, SIDNEY, M.D., Medical Officer of Health and School Medical Officer for Derbyshire.

BENNETT, NORMAN G., M.A., M.B., L.D.S., Chairman of the Representative Board of the British Dental Association.

BUTTERFIELD, F., Secretary of the Incorporated Dental Society, Ltd.

CARSE, J. D., Secretary Dental Society of Ireland.

COYSH, T. A., L.D.S., Chairman of Penal Cases Committee of the British Dental Association.

FISHER, VICTOR, Hon. Secretary National Dental Corporation, Ltd.

GRAHAM, LEWIS, M.S., F.R.C.S. (Eng.), Temporary School Medical Officer to the Birmingham Education Committee.

HALLETT, F. G., Director of Examinations, Royal College of Surgeons of England.

HARPER, CHAS. J. S., Solicitor to the General Medical Council.

HARRIES, BENSON, Secretary Chemists-Dentists' Society of Great Britain and Ireland.

HOPSON, MONTAGU F., L.D.S., Member of British Dental Association.

JENKINS, J. D., M.D., Medical Officer of Health and School Medical Officer for Rhondda Urban District.

MACALISTER, SIR DONALD, K.C.B., M.D., Principal of Glasgow University and President of the General Medical Council.

MORRIS, J. H., Managing Director of the Macdonald Manufacturing Co., Ltd.

PEDLEY, R. DENISON, F.R.C.S. (Edin.), L.D.S., President of the School Dentists' Society.

RICHARDSON, E. Y., L.D.S., Member of the British Dental Association.

ROBERTSON, J., C.M.G., O.B.E., M.D., Medical Officer of Birmingham.

ROBINSON, P. J. HALL, Solicitor to the Incorporated Dental Society, Ltd.

SPOKES, P. SIDNEY, M.R.C.S., L.D.S., J.P., Vice-President of the London and Counties Medical Protection Society, Ltd.

TOWART, J., L.R.C.P. (E.), Member of the Council of the Medical and Dental Defence Union of Scotland.

WARING, COLONEL H. J., F.R.C.S., M.S., B.Sc., Chairman of the Court of Examiners and Member of the Council of Royal College of Surgeons of England.

WATSON, G. HILLS, L.D.S., School Dentist for the Burgh of Leith and Representative of the Medical and Dental Defence Union of Scotland.

WEBB, Professor Sir SIDNEY, LL.B., London University.

WHEATLEY, JAMES, M.D., Medical Officer of Health and School Medical Officer for the County of Shropshire.

WINDLE, SIR BERTRAM C. A., M.D., F.R.S., Member of the General Medical Council and Principal of University College, Cork.

WOOD, B. J., L.D.S., Member of the British Dental Association and School Dentist for Kettering Urban District.



ARTHUR W. BROWNE.

THE DENTAL COSMOS

Vol. LXI.

JULY 1919.

No. 7

ORIGINAL COMMUNICATIONS

Report of Five Years of Mouth Hygiene in the Public Schools of Bridgeport, Conn.

By ALFRED C. FONES, D.D.S., Bridgeport, Conn.

DIRECTOR OF THE DENTAL DEPARTMENT, BRIDGEPORT BOARD OF HEALTH.

(Read before the Connecticut Dental Hygienists' Association, Bridgeport, Conn., May 30, 1919.)

IN presenting a report of the findings of a five-year demonstration of an educational and preventive dental clinic in the first five grades of the public schools of Bridgeport, Conn., it is interesting to review the reasoning and deductions by which the plan was perfected. Previous to the establishment of the clinic in 1914, the writer presented a paper entitled "A Plan that Solves the Fundamental Problem in School Hygiene" before the Fourth International Congress on School Hygiene, in Buffalo, August 26, 1913. In it the author reviewed the physical status of the average school child and the problem which the unsanitary condition of his mouth presented, and evolved a plan for its solution. At that period little was known of focal infections, which have proved to be a greater evil than anything yet recognized as traceable to decayed teeth.

The paper makes a logical introduction to this report, and is presented in full as follows:

A Plan that Solves the Fundamental Problem in School Hygiene.

To analyze the subject of hygiene for the uplift and betterment of the children in our public schools, we must determine the main factors existing at present that act as a detriment to proper development and also as the chief cause of illness in child life.

The large number of papers presented at this congress, covering so many phases of the subject, merely prove that we must reach a conclusion, first as to where we should concentrate our energy, and then one step at a time eliminate the most conspicuous evils that beset the school children of our country.

If our large steel plants and rolling mills were obliged to re-roll from 20 to 35 per cent. of their stock, it would not take them very long to find out what was the matter. No

business nowadays could stand such a high percentage of loss in doing its work over again. In our public schools throughout the country it is a fair estimate to say that the percentage of grammar school children who are reviewing their grade will range between 20 and 35 per cent.; in the majority of the cities the average will be nearer the latter figure. What is the matter? Is it our system of teaching, crowded schools, poorly lighted or ill-ventilated buildings, or is the chief cause to be found in the material itself, the child?

Let us examine the average boy of ten years of age and see what we find. Face, ears, and nose unclean, hair unkempt, hands grimy and finger-nails dirty. Shoes splashed with dry or wet mud, clothes soiled, and an odor percolating through the atmosphere to excite suspicion that his little body has not been washed for some time. His eyesight may apparently be good and yet it may be defective. If his face is washed it may disclose a color that is lacking in the bloom that a boy of ten should have.

If otherwise his body appears normal we ask him to open his mouth. If his external appearance troubles us, his internal appearance shocks us. Here we find teeth covered with green stain, temporary and permanent teeth badly decayed, possibly fistulas on the gum surface showing an outlet for pus from an abscessed tooth or teeth, and decomposing food around and between the teeth. Why examine the child any farther? Here at the gateway of the system is a source of infection and poison sufficient to contaminate every mouthful of food taken into his body. With decomposition instead of digestion taking place in the alimentary tract, it is no wonder that the child suffers from auto-intoxication which produces eyestrain, anemia, malaise, constipation, headache, fevers, and many other ailments.

Such a mouth is an ideal breeding-ground for germ life, and a child with such a mouth is far more susceptible to infectious diseases than one whose teeth are sound and kept free from food debris. Suppose at the entrance of our cities such a rank condition existed. How long would it be before disease and sickness would be swept in among the inhabitants? The condition of the boy described is but duplicated in the girl of ten. Decayed teeth constitute the most prevalent disease known. It is difficult to find two children out of one hundred with perfectly sound sets of teeth. In a thorough dental examination of five hundred and fifty school children in the town

of Stratford, Conn., but one child was found to have a set of teeth free from decay.

Look over the reports of the medical inspectors in the public schools who have made but a glancing examination of the mouths, and you will find that decayed teeth outrank all other physical defects combined.

Therefore we must deduce from our analysis of school hygiene that the most conspicuous defect of the child is the unsanitary condition of his mouth. Like a pig-pen or garbage-drain slowly seeping its poison into the brook which flowing into the reservoir contaminates the water supply to a city, so do the products of abscessed and decayed teeth with decomposing food slowly but surely poison the human system. Such mouths and teeth breed disease. Such children cough and sneeze millions of germs made virulent and active in an ideal feeding-ground.

And then, again, the teeth as a crushing and masticating machine are frequently ruined by the time the child has reached the age of twelve or fourteen. It is true that they can limp through life with this dreadful handicap, the same as an automobile can climb a steep hill on three cylinders, but you can rest assured that the child with a wrecked mouth at fourteen is traveling on his second speed until he reaches thirty-five, and from there he drops into his low gear to finish the journey in a slow and uncertain state. It is true that many have lived to a ripe age with unclean mouths and wrecked teeth, not on account of such conditions but in spite of them.

If it be conceded that the most unhygienic feature of child life is its mouth, we then come to the problem, How can we establish clean mouths, sound teeth, and toothbrush habit? To try and fill the teeth of the children in our public schools is a noble charity but an endless chain. Like an immense flood decayed teeth have spread over the civilized world to such an extent that hardly one-tenth of the population of a country such as ours could find a sufficient number of dentists to fill its teeth. I believe it to be a conservative estimate to say that the children found in the first five grades of our public schools would average not less than 6* good-sized cavities in their teeth. If you will but figure out how many children there are in your city in the first five grades, you can roughly estimate the immense amount of work there would be for a corps of dentists to cope with such a task as filling their teeth.

* [Later findings showed 7 +.]

This would not mean merely plugging a hole in a piece of ivory, it means the painstaking work of a dental operation on live tissue.

But let us assume that it is possible to fill these teeth and save them for the time being, how are we to prevent the re-occurrence of decay as well as check the flood among children coming into the schools in the primary grades each year? Surely every dentist knows that the toothbrush alone will not stop it, and every dentist also knows, as well as the parent, how difficult it is to induce children to properly brush their teeth and take care of their mouths as they should. Would it not be better to evolve a system for the prevention of dental decay and the establishment of clean mouths than try to cope with the hopeless task of filling the thousands of decayed teeth? I am heartily in sympathy with the scheme that every city should have a dental clinic for the school children for the relief of pain, and I believe it is inhuman in this twentieth century to allow the poorer classes of children to suffer as they do from toothache. But let us draw a line on the conditions as they exist today, and I would present this plan, partly suggested by Dr. Ottolengui of New York, for your consideration.

It is a clinical fact that fully 80 per cent. of dental decay can be prevented, if monthly, or even bi-monthly, surface polishing of the teeth with orange-wood sticks and fine pumice can be systematically followed; these treatments, of course, to be augmented by a faithful and correct use of the toothbrush, floss silk, and lime-water as a mouthwash.

Suppose it were possible to start a year from this September and place in our schools trained women who would confine their efforts the first year to the children in the first grade—these women to be trained and educated as hygienists, who would be competent to give each child a surface treatment of the teeth once a month. Each woman to have the supervision, to start with, of 200 children; these children in the first grade to be taught the proper use of the toothbrush, mouths inspected daily for cleanliness, and no child permitted to enter the classroom who had not brushed his teeth. Hands and face to be clean and hair combed. Bodily cleanliness also insisted upon, and efforts made to secure the co-operation of the parents. Talks in the classroom as well as the use of the stereopticon in the assembly room would greatly aid in securing the desired results. These hygienists could also be of great aid to the medical inspectors. At the end of the

year they would follow the children into the second grade, and a new corps of hygienists would enter the first grade with the new pupils. This to be repeated for five years until the first corps of women were caring for their children in the fifth grade. It is doubtful if it would be necessary to carry this work beyond the fifth grade, as the child would be cared for through the most susceptible period for dental decay.

Now, what would such a system mean to the children? It would mean that from the first day the child entered school it would be taught cleanliness. That when the first permanent tooth entered the mouth it would be under the supervision of the hygienist, who would teach the child how to keep it clean, and who would also aid with the monthly polishing. It would mean that during the first five years of school life, habits of cleanliness would be established that would mold these boys and girls into new types of men and women. Fully three-quarters of the diseases incident to child life would be eliminated. With an additional knowledge of food values and how to properly masticate their food instead of bolting it, the main factors for hygiene would be covered.

Booker Washington once said, "If I can teach the colored man the gospel of the toothbrush I feel that I can make a man of him." Those of you who see but little of children can hardly realize what an uplift and different point of view there comes with a clean mouth and polished teeth. It is interesting to see a child whose teeth have been polished and a washbowl instruction given in the use of the toothbrush, gradually change in general appearance regarding cleanliness. I have known them in a few weeks to choose a new set of companions because the old friends no longer looked attractive to them. No one ever saw a rowdy with a clean mouth, for cleanliness breeds refinement. The proper food supply to the body and cleanliness are the two main foundation pillars for health, and these must be taught and practiced before we can hope to obtain satisfying results in the betterment of child life. There is much in life worth while besides teeth, but I know of no one factor that is more conducive to health than sound teeth and a clean mouth.

The question may be asked, How are we to educate these women to be dental hygienists? In every large city there are men in both the medical and dental professions who are competent to establish a lecture course for this purpose. The necessary training in the prophylactic treatment of the teeth would of

course be given by dentists. Both of these professions are anxious to aid in any cause so worthy, and I believe they would willingly give their time and knowledge to start such a movement. It is impossible in this paper to give the details concerning the education of these women and their full duties in the schools, but enough has been stated to permit those in charge of our public school system to consider the proposition in a general way and determine if this plan is a solution of the main problem regarding school hygiene.

For four years previous to 1913, strenuous efforts had been made to interest the city officials of Bridgeport to provide funds for an educational and preventive dental clinic in our public schools. At last \$5000 dollars was apportioned to the Board of Health in order that a demonstration might be made to prove the value of a mouth hygiene campaign conducted on an educational and preventive plan.

With the possibility of this movement being a powerful aid in the prevention of dental decay and infectious and communicable diseases, eighteen prominent educators in the East agreed to come to Bridgeport and give their services gratis to educate a corps of women to be known as "dental hygienists." The course was started late in the fall of 1913, and in June 1914 the first class of dental hygienists was graduated.

The Board of Health appointed a committee of four dentists and one member of the health board, a physician, to establish the system in the schools. Eight dental hygienists and two supervisors were chosen, and in September 1914 the work was begun for the first and second grade children.

There were four distinct parts to the system. First, prophylactic treatment, or the actual cleaning and polishing of the children's teeth and chart examination of the mouths. Second, toothbrush drills and classroom talks. Third, stereopticon lectures for the children in the higher grades; and Fourth, educational work in the homes by means of special literature for the parents. The prophylactic treatment consisted mainly of the thorough cleaning, by means of orange-wood sticks in hand polishers, of every

surface of every tooth. This meant that the dental hygienist would remove all stains and accretions from the surfaces of the teeth, and especially the mucilaginous films known as bacterial plaques, which are the initial step of dental decay. The treatments were given in the schools, the equipment being both portable and adapted to almost any location. Every child received the same treatment regardless of the financial status of the parent; in short, this preventive system was incorporated as part of the school curriculum. Some parents objected, thinking the work was a charity, but with a better understanding of it the objections were soon withdrawn.

The toothbrush drills were given by the supervisors, and a method of mouth-brushing was taught for use in the home. No attempt was made to use water and a dentifrice in the classroom, as this would prove to be too mussy. Classroom talks concerning foods, cleanliness, etc., were part of the drill.

The total number of children examined and treated in the first and second grades during the first year was 6768. On the first examination less than 10 per cent. were brushing their teeth daily. About 30 per cent. claimed that they brushed their teeth occasionally, while 60 per cent. were frank enough to state that they did not use a toothbrush. Ten per cent. of the children were found to have fistulas on the gums, showing the outlets of abscesses from the roots of decayed teeth, and they averaged over seven cavities per child. It was shocking to find the mouths of these children ranging from five to seven years in this deplorable condition, and it was appalling to contemplate the conditions that would exist in these mouths as the children grew up. It presented very interesting material to work with.

It will take a long period of public education before the mouths of the incoming children to our first grade will show any great degree of improvement. From birth to five or six years of age they are entirely under the home influence and are permitted to eat foods, especially sweets, that are conducive to

decay, and mouth cleanliness is not compulsory. Slowly but surely the public school education will seep back into the homes, and with the aid of the older children and pamphlets it is our hope that eventually the mouths of these children will present a much improved condition.

In September 1915, six additional hygienists were added to the corps to advance the work to cover the first three grades. This gave a sufficient number of workers until 1917, when six more were added so that this care could be given to all the children in the first five grades, numbering about 15,000.

In January 1918, the parochial schools petitioned the Board of Health and the Board of Apportionment to have this system extended to these schools as a health measure. This petition was granted and in September six more hygienists were added to the corps for this purpose, making twenty-six in all. At the present time these women have under their care the mouths of nearly 20,000 children in the first five grades.

We have also employed three women dentists to fill the small cavities in first permanent molars for the children in the first and second grades. Many of these children on entering school have small cavities developing in these most important teeth, and in order that all the children may start on an equal basis in the future prevention of dental decay of the permanent teeth, all are eligible and are encouraged to have these small cavities filled.

In order to prove definitely the value of education and prevention, it was necessary to have data of the condition of the mouths of the children in the higher grades who had never had the advantage of prophylactic treatments, toothbrush drills, and education in mouth hygiene. The children in the fifth grade were chosen as the control class, and this report will present the comparison of their mouth conditions with the present fifth-graders, who have had prophylactic treatments and education in mouth hygiene for the first five years of their school life. They have had no repair work provided

for them, and the educational side has been three-quarters of the work of the dental hygiene corps.

In making this demonstration it was not our expectation to make a startling reduction in the percentage of dental decay, the main object being to show up the pernicious mouth conditions prevailing among school children and to prove the value of prevention and education in mouth hygiene for great numbers of children, in preference to extensive repair clinics with no effort to eliminate the source of the trouble. It would of course have been ideal to have had the two types of clinics and put the children's mouths in sound condition, but funds were not available for this purpose, and the excellent report shown is merely the result of education and prevention.

For the purpose of securing this data a complete record chart of the condition of every child's mouth at each successive treatment has been maintained, and the following figures were obtained by comparing the average number of cavities per child in the fifth grade of a given school with the average secured from the same grade of the same school several years ago. The demonstration was conducted in thirty schools, and this year 20,000 individual children received this treatment and education.

DENTAL CARIES.

Following is the percentage of reduction of cavities in the permanent teeth of the fifth graders in these schools:

The highest was Barnum school, which showed a reduction of 67.5%.

The following five schools were over 57%: Huntington Road, Kossuth, Prospect, Grand, and Sheridan.

Two schools, Maplewood and Franklin, showed over 50% reduction.

Three schools, Summerfield, Lincoln, and Staples were over 40%.

Washington, Wheeler, and Black Rock were over 30%.

Newfield, Garfield, Hall, Jackson, and Shelton were over 25%.

Bryant, Elias Howe, and Madison were over 20%.

Those over 15% were Waltersville, Jefferson, Longfellow, Columbus, and Webster.

One school, Read, was below 10%, and two schools, Whittier and McKinley, showed a minus record.

The total *average* for all these schools amounts to 33.9%.

Although the principals and teachers have given splendid co-operation in many of the schools that have low records, they had to contend with a certain number of children whose home influence was not conducive to any interest in mouth hygiene.

The two schools which showed a minus record were unfortunate enough to have a number of children who were so absolutely negligent in the care of their mouths that they dragged down what would have been a reasonably good average by three-quarters of the children.

Bridgeport has been one of the most difficult cities in which to carry on a demonstration of this kind. We have a large foreign population of which many parents do not speak English. Being a munition center during the war period, the population increased many thousands, overcrowding the city and schools. The school records showed in the past year that 58% of the children changed addresses and that the population was constantly shifting. The principals and teachers were occupied with many war duties, such as Junior Red Cross, thrift stamps, Hoover programs, etc.; in short, no period could have been more unpropitious for a serious demonstration of this kind.

Aside from this, the value of education and prevention has, with deliberate intent, been put to the hardest possible test. No effort has been made to address or educate the teachers or to enforce co-operation through the office of the superintendent of schools. The supervisors and dental hygienists have been permitted to win their own way so that it might be demonstrated that what was accomplished in Bridgeport could be accomplished in any city.

We believe from 70 to 80 per cent. of dental caries can be eliminated through the public school system by the incorporation in the school curriculum of a definite health program, making hygiene

one of the requisites for promotion. This would insure the co-operation and interest of child, teacher, and parent.

The elimination of dental decay is so dependent upon factors other than cleanliness and education in mouth hygiene that it is surprising to note the large reduction in many schools. The most important factor is that of diet, and co-operation in this matter can be secured only after many years of education. The correct feeding of a child from birth to twelve years would in itself partially if not wholly eliminate dental decay. The education of mothers regarding the feeding of children after they reach an age when milk does not meet the requirements of the body is very essential, but it is necessarily slow, and little co-operation can be secured at this time. The most important factor would be the elimination of free sugar from the diet. This seems radical to the vast majority of our people, who consume ninety pounds of sugar per capita a year and look upon it as a food and a necessary part of the diet. This is an erroneous idea, since nature has provided all the sugar the body requires in various common foods as milk, fruits, some of the vegetables, etc., besides providing that all starchy foods such as pastries, bread, macaroni, rice, etc., shall be changed into sugar in the digestive process. The excessive consumption of free sugar is undoubtedly the cause of exceedingly poor teeth among the English, French, and American peoples.

It is not hard to imagine that a very large percentage of children are constantly laboring under a handicap of faulty feeding, which in turn produces a long line of other handicaps, such as malformed jaws, decayed teeth, underdevelopment, malnutrition, etc., while normal conditions could be secured by correct diet and cleanliness.

MALOCCLUSION.

Aside from dental decay, the most noticeable defect in the mouths of the school children is lack of proper relationship between the jaws and teeth, or mal-

occlusion. The symmetrical development of the braincase and the bones of the face, as well as good digestion, is dependent upon a perfect masticating machine. It was astonishing to note that malocclusion was present in .98 per cent. of all the children examined in the past five years. This deplorable condition could be remedied to a great degree by the feeding in early childhood of the hard, coarse foods requiring pressure to thoroughly masticate and by the prevention of any pernicious habits such as thumb-sucking, the use of pacifiers, mouth-breathing, etc. Undoubtedly adenoids would be prevented to a marked degree if the roof of the mouth could be broadened and lowered by pressure exerted in chewing. This would mean wide nasal cavities that would be conducive to nose-breathing and proper functioning of the nasal passages.

When but 2 per cent. of our school children have regular teeth it adds to the difficulty of eliminating dental decay, since irregular teeth offer the greatest opportunity for the formation of cavities and render the thorough cleaning of the mouth very difficult.

RETARDATION.

Our modern city school systems all have a smaller or greater percentage of retarded pupils. The test of the success of any city school system at any given time is not whether there be at that time a large percentage of retarded children, but whether a decided trend can be traced toward an increase or decrease in the percentage of such retarded children.

Retardation is a serious matter from the standpoint of the pupil, the parent, the teacher, and the community. Retardation means re-education, and this in turn means application of the public funds for repeating the operation. In the figures given below, the very liberal standard adopted for retardation permits the child to be two years older than his grade would warrant and still be classified as regular. Those who are more than two years older than entering the first grade at the age of five would indicate are classified as retarded.

The statistics at hand in the office of the Board of Education are not available year by year, but two general surveys have been made—one during September 1912, and the other in November 1918. These surveys, called the "age-grade report," immediately precede the opening of our work, and occur near the close of the first five-year period, and so offer rather unusual opportunity for inference as to the effects produced. Reduced to a percentage basis, the changes that have taken place in the matter of retarded pupils in the grammar schools are summarized in the following table:

Percentage of retarded children.

Grade.	Sept. 1912.	Nov. 1918.	Drop in retardation.
I.	16.5 %	8.1 %	51.0 %
II.	37.0	15.3	58.0
III.	53.0	24.7	53.0
IV.	59.5	31.7	47.0
V.	61.0	33.1	45.0
VI.	54.0	30.4	44.0
VII.	39.0	19.3	50.0
VIII.	27.0	12.5	54.0
Average.	40.0	20.1	50.0

This reduction of retardation by 50 per cent. is a really wonderful change to accomplish in any school system in a period of five or six years. Few people have realized the cost in money—which is only one of the evils of retardation—of the re-education of our retarded children. By actual figures the following statement holds true:

Cost for re-education in Bridgeport, for				
1912 equals 42% of entire budget.				
1918 " 17 " " "				

One has only to consider the financial side to recognize that any reduction in retardation is an accomplishment devoutly to be sought through all legitimate means. Bridgeport has been moving distinctly forward in this matter.

That this change has been a vital one to the self-respect of the pupils, and in the advance of the moral conditions of the normal children, is easily realized when one stops to consider the change in the location in our grades of the

pupils fourteen years of age and over which has come about during this same 1912-18 survey.

Pupils fourteen years of age and over.

Grades	I.	II.	III.	IV.	V.	VI.
Sept. 1912 . .	13	17	58	107	169	212
(4% of elementary pupils.)						
Nov. 1918 . .	0	0	11	35	109	155
(1.5% of elementary pupils.)						

Nor does this tell the entire story. As a result of this 1912 survey the following statement is made: "During the fifteen months ending last December, 1356 children in grades II to VI, all of the retarded class and over fourteen years of age, left school to go to work." Examination of the records of the State Examination Board reveals the fact that during the same period of the last year less than 300 pupils, all of whom came from grades V and VI, received working certificates.

Another effective proof of the great forward movement that has taken place in the lower grammar-school grades is submitted in the following form:

In 1912, 60% of all the children registered in the grammar schools were below the fourth grade, while in 1918 but 50% were below the fourth grade. Similarly in 1912, 85% were below the sixth grade, and in 1918 but 78% were below the sixth grade.

Without taking into consideration the physical condition of the children, educators claim that the three major factors producing retardation are—

- (1) Overcrowded classrooms.
- (2) Uninteresting and unsuitable courses of study.
- (3) Unqualified teachers.

Regarding the first, the following situation is interesting to note:

Average pupils per teacher, 1912 . .	38
" " " " 1918 . .	40

The cause for reduction in retardation does not lie here. This has been rather a hindrance to its reduction.

In regard to the course of study, a very effective reorganization of the subject matter in arithmetic, geography,

language, and history has been made within the past three years, and that, no doubt, has had a large influence in the matter of producing an interest in their work on the part of the pupils. This must have had a very potent influence in reduction of retardation.

With respect to the matter of teachers, the *personnel* and chief source of supply in Bridgeport remains about the same as in 1912. Our city normal school produces most of the additional teachers placed in the grammar school grades. A well-arranged study program has been introduced for teachers requiring application to approved courses for advancement in salary, and this has probably resulted in a more wide-awake teaching body than we had in 1912.

These changes, however, could hardly have effected on their own account the phenomenal reduction in retardation that has occurred in the period stated. The most sanguine advocate would hardly take the ground that such a remarkable change had been effected simply by the introduction, late in the period under discussion, of modified courses of study. There must have been other contributing factors with a large influence.

Our dental work has called attention to the necessity of taking into account the child's well-being. For the greater part of the period of this demonstration this work stood practically alone in any progressive health movement. During the latter part it has been aided by the city department of Health with an enlarged force of nurses, and at the present time the superintendent of public schools is planning a Health program to be introduced into the grammar schools in September, as a big, serious effort in recognition of the fundamental physical basis for all education. He says, "The dental clinic has been without question a great factor in the health of the children, and therefore must have been one of the factors in reducing the condition of retardation, which figures show have been reduced 50 per cent. since November 1912. Our promotions are now better than normal."

With all these facts balanced, it seems only fair to conclude that while the work of the dental division in the public schools is somewhat intangible, it has had a very marked effect upon a more normal promotion of children, since the change cannot be explained by other factors.

COMMUNICABLE DISEASES.

The forms of communicable diseases where mouth hygiene could play an important part for prevention are those which involve the respiratory tract or find ingress to the body through the mucous membrane lining the mouth, throat, and nares. The resistance to bacterial invasion may not be determined entirely by the contents of the blood, but by the tone and resistance of the cells of the individual tissues on which the bacteria may lodge temporarily. One bacterium does not produce a disease. It is only when the environment proves favorable for propagation and the production of large numbers that infection occurs.

Any continuous effort that has for its object the removal of dead animal and vegetable matter, such as food debris, from all the surfaces of all the teeth, the stimulating and keeping up the tone of the membrane lining the mouth and the reduction of the number of bacteria in the mouth to a minimum must act as a powerful preventive by aiding the tonsils, the soft palate, and the pharynx to maintain a normal and healthful condition. Conversely, those mouths which are neglected and contain decayed teeth with decomposing food, red and congested gums, enlarged tonsils, and a palate and pharynx covered by an irritated and partly congested mucous membrane, present an ideal field for the lodgment and incubation of the pathogens. How much of the communicable disease that gains ingress through the mouth will finally be eliminated from child life in our public school systems by an enforced system of mouth hygiene is still a question, but all evidence seems to show that a clean mouth with sound teeth is the one most important factor for prevention.

Up to a short time ago we had no

tangible records in the department of Health that pertained to communicable diseases in the children of our public schools, whereby comparisons could be made from year to year of an increase or decrease in the numbers of these diseases. It is therefore impossible at the present time to show what obtained in the schools four or five years ago in comparison with what obtains today.

Out of the death-rates from all causes in this city we have been able to find records of three diseases which are common among children, namely, diphtheria, measles, and scarlet fever. These are figured on a basis of per 100,000 population, and show the following percentages:

	1914.	1918.
Diphtheria	36.6%	18.7%
Measles	20.0	4.1
Scarlet fever	14.1	0.5

From the death-rate tables the general inference must be that the percentage of communicable diseases is gradually decreasing.

INFLUENZA.

The record of Bridgeport during the great scourge of influenza was an exceptionally good one. The deaths amounted to 5.2% per 1000 population. This is the lowest record we have been able to find as yet in cities approaching the size of Bridgeport.

The city Health officer took the stand that since influenza was spread by the expelled secretions of the mouth and respiratory tract, the greatest means of suppressing this disease would be the knowledge of children and adults of the dangers of coughing, sneezing, and spitting. He inaugurated an intensive educational campaign in theaters, motion-picture houses, and at all public gatherings regarding the contraction and spreading of influenza. During this period he stated that an intelligent background for this education had been prepared by the regular work of the dental clinic in instructing children individually and in distributing thousands of hygiene pamphlets in the homes for the

enlightenment of the parents regarding common ways of spreading diseases and the hygiene of prevention. Five years of such education in conjunction with mouth hygiene played an important part in giving our citizens as a whole a more intelligent impression regarding contagious diseases, and the Health officer and his co-workers had a more enlightened public to work with. He states further that "The most important side of this work is the educational opportunities afforded the hygienist. She is an important factor in raising the sanitary intelligence of the community—which is, after all, the object for which modern health workers are striving."

SUMMARY.

To summarize, we have found—

That in schools or districts where little or no attention has been given to mouth hygiene it is difficult to find three children out of a hundred with teeth entirely free from dental caries. We have also found that owing to this lack of education and enlightenment, not more than 10 per cent. of the children were using a toothbrush daily.

That malocclusion, which means that the teeth are out of their normal position in the mouth, thus preventing their striking the teeth in opposition as nature intended they should strike, is as common as dental caries.

That retardations are greatly influenced by the toxic effect produced by numerous bacteria in unclean mouths and diseased and pulpless teeth.

Although properly tabulated records of the Board of Health do not date back far enough to show facts and figures regarding communicable diseases, yet we have sufficient data which, on close observation, convince us that mouth hygiene is to be a very powerful factor in the restriction of communicable and infectious diseases in childhood.

For years the dental profession has appreciated the toxic influence on the system of unsanitary mouths and the dangers presented to the individual by such mouths incubating hundreds of mil-

lions of bacteria. It has been apparent that among adults infections of the system were taking place around the necks of the teeth, through the inflamed and diseased tissues which support them, but it was not until the X-ray revealed the infected areas at the ends of the roots that dentistry appreciated to the utmost the seriousness of neglected mouths and pulpless teeth. These apical infections are difficult for the layman to understand, for they produce no soreness, no pain, no inflammation, no pus. They are caused by a type of bacteria known as the streptococcus viridans, which are quite friendly and harmless in the mouth, and which belong to the saprophytic class. When a pulp dies in a tooth these bacteria commonly gain ingress through the root-canal of the tooth to the apex, or out into that area where the tissues are bathed with the body juices or serum. In this new environment they gradually change their nature, and instead of securing their food from dead animal or vegetable matter such as they found in the mouth around the teeth, they are now enabled to obtain their nourishment from the blood serum which surrounds them. Like all bacteria, they exude waste matter from their bodies which is a toxin, but these bacteria being of low virulence do not create as vicious a toxin as many of the pathogens. However, the toxin is of sufficient irritation to cause the osteoclasts to break down and absorb the bony wall around the end of the root of a tooth, which destruction of bone may be readily seen in the X-ray picture. This toxin is absorbed by the lymphatic vessels, and its presence in the blood undoubtedly excites the production of an antitoxin which neutralizes this poison and may successfully control it for years. As long as the individual maintains normal health and the antitoxin is produced in sufficient abundance to act as a neutralizer these infected areas remain harmless. The longer these bacteria live in this environment of serum, the more aggressive they become, and although they do not seem to take on the virulence of a true pathogen, yet when the bodily

resistance becomes lowered they make the trip from the end of the root of a tooth through the lymphatics and into the blood stream.

These micro-organisms vary in their affinity for certain tissues, some finding the valves or the lining membrane of the heart the most favorable, others the kidneys, while still another class may locate in the joints; in fact, there seems to be no limit to the organs or tissues in which the various members of this family may find a congenial habitat. Having once located in a favorable environment in the body, they again form colonies, and, exuding their toxin, so poison and lower the activities of the cells of the tissues upon which they are located that these cells eventually find it impossible to properly functionate and carry on their individual work, and we have the beginning of a diseased tissue or organ of the body. It is because the action of these saprophytes is so slow and because they possess such a low virulence that the medical and dental professions at large have failed to grasp, as yet, what a terrible menace these focal infections are to human life; and again, the sad fact is that they are so exceedingly common—for nearly every adult has one or more pulpless teeth in his mouth, and nearly every adult will show under the X-ray affected areas above such pulpless teeth. If the resistance remains high they may carry such infection for ten, yes, twenty years, but a colony of these bacteria living within bone tissue and exuding their toxin into the blood stream will sooner or later create systemic disturbance which, if not taken in time, will mean the beginning of the end. Recently the writer has been attempting to prove for his own satisfaction whether or not the streptococcus viridans found in these infections had developed the nature of a pathogen. In a number of cases, cultures made from infected roots proved fatal within forty-eight hours after their injection into mice.

With these thoughts in mind, it must in the near future be recognized that a toothache is a calamity, for toothache usually means that decay has already

reached the pulp, and a dead pulp means danger of apical infection. The best root-filling we know of is a live pulp, therefore the effort must be made to prevent decay from penetrating deep enough in a tooth to involve the pulp.

When these various pernicious mouth conditions are more fully understood as the greatest factor for producing disease, medicine will acknowledge dentistry as its greatest specialty. Also, from a prophylactic standpoint, mouth hygiene will be considered the most important branch of general hygiene.

It must soon be apparent to the educators in our public school system throughout the country that a health program of considerable magnitude is essential in these schools for the prevention and correction of remediable physical defects among the children. These defects, if neglected, may eventually be the cause of the child's disability, and in later life can have a detrimental action morally, mentally, and physically. No longer can they specialize on mental development and leave the body of the child entirely in charge of home influence. The findings of our draft boards have conclusively shown us the fallacy of such procedure. If we study the following table submitted by General March of the U. S. army, compiled from the data collected by the draft boards, we will find that there has been dire neglect in the supervision of the child's body:

The effectives at ages twenty-one to thirty-one, approximately 10,000,000 men, in 1917 were—

21 years, 46%	26 years, 29%
22 " 43	27 " 27
23 " 39	28 " 26
24 " 35	29 " 23
25 " 32	30 " 22

The effectives at the ages thirty-two to thirty-six drop to less than 15%.

Special attention is called to the rapid accumulative effect of physical disabilities after the adult passes thirty years of age.

Dr. Osler has stated that the diseases of which we die in adult life are those

which are contracted or made possible in early youth.

The figures in General March's table would seem to corroborate statements repeatedly made by pathologists that after thirty years of age physical resistance to disease is on the decline, and in the vast majority of people can only be maintained in middle life by healthful habits and freedom from physical defects that permit of bacterial invasion into the system.

This demonstration has provided sufficient data to convince us that every community, sooner or later, must adopt some plan, preferably one of prevention, to establish clean mouths and sound teeth for school children.

We know of no one movement, from the health standpoint, that would be more beneficial to the nation at large than a serious educational campaign to eliminate dental caries as far as would be possible. There is so much in this work that cannot be measured in figures—especially the moral uplift which comes to the individual when he is taught the importance of cleanliness and a wholesome respect for his body.

The prevention of diseases such as syphilis, tuberculosis, dental caries, etc., will come not through any specific form of medication or treatment, but chiefly through education and enlightenment.

Books, pamphlets, articles in magazines and newspapers, all are of great value in disseminating knowledge, but for actual tangible results in eventually reaching all members of a community, nothing will compare with thoroughly spreading such knowledge among the children in our public school system.

The results as shown in this report may be obtained in practically any section of the country, if the hygienists and supervisors in charge of the work are sufficiently educated in their specialty. It must be clearly understood that although the dental corps has been guided in its work, what has been accomplished has been mainly through its own intelligent individual effort and not through any coercion of the teachers by the educational authorities in charge of the school system. This demonstration was conducted along these lines under the least favorable circumstances purposely to prove the real efficacy of prevention. It is our hope that from now on a definite health program will be introduced into our school system in Bridgeport that will give the teachers a greater appreciation of the importance of sound bodies for the children, thus securing a complete co-operation and interest on their part in this most important phase of child welfare.

10 WASHINGTON AVE.

Relation of Dental Affections to Systemic Diseases.

By ALFRED STENGEL, M.D., Philadelphia, Pa.

(Lecture delivered before the Pennsylvania Association of Dental Surgeons, Philadelphia, April 8, 1919.)

I WAS asked by your president to discuss the relation of dental affections to constitutional diseases. Before beginning with the subject-matter proper let me direct your attention to the question of fads and fancies in medicine. I have been long enough in practice—as this month will complete my thirtieth year—to have seen many changes in my profession, as well as in yours; and I want to go back over a few things that have arisen and suffered material changes in the time since I first began my career as a medical man.

SURGICAL FADS.

When I was a medical student we were just emerging from that era of gynecological surgery when they burned and amputated the cervix uteri for all kinds of ailments, mainly nervous diseases; but that practice had practically died out when I came on the scene. I do not think that, in my student days or afterward, I ever saw this done except for active disease of the cervix; but to amputate or mutilate a relatively normal cervix for the supposed effect on general, mainly nervous, diseases, had passed away.

We were, however, in the midst of a much more serious assault on woman-kind; because it was just in the beginning of the most detestable period of ovariectomy, when bushel-basketfuls of normal ovaries were gathered in by some of the surgeons of the day. Many lived to regret bitterly that they had lent themselves to a fad that had not been

properly weighed and scientifically considered. What has been left of that? Why, there has been left the operation of removing ovaries when hopelessly damaged and diseased; but the removal of the normal organ, except for some disease of a special character, is of the past. We were, however, in the midst of that era at the time.

Then came the appendix era, and the number of normal appendices that were shed at the behest of our surgical friends was as voluminous as that of the ovaries in the ovariectomy period just preceding it. There was a time when for a mere medical man like myself to have asserted to a surgeon that there was some doubt in my mind as to whether an immediate incision should be made in the right iliac fossa and an appendix taken out, because that patient had more or less severe stomachache would have laid me open to criticism, and perhaps abuse. That period passed. What has been left? The conclusion of doctors and surgeons alike that a real affection of the appendix calls for surgery, and that problematic disease of the appendix is a matter that should be weighed and considered carefully before operative interference is even suggested.

These are three conspicuous examples that even a layman will recall, of fads that were ridden to death. Undoubtedly they did a great deal of harm to various individuals in the community; although out of them there came, except in the case of the first operation mentioned, a great good to medical as well as to surgical practice. Reformers are always

extremists, and we must beware how we take a reformer for our guide in the ordinary procedures of life. We should treat him as Polonius advised his son to do. We should lend our ears, listen to what they have to say, and reserve our judgment. But worse than these are those who are not reformers, but imitators of reformers, who often go a step farther than the man who has had the first conception, and these are they who often carry good things to ridiculous extremes. When I see in a popular magazine the alleged story of a celebrated personage, recently dead, who was known to have been subjected to a violent general infection and was left an invalid and did not wholly recover, and see paraded in the magazine article an account of how an abscess around the root of one of his incisor teeth was the cause of all his difficulties and his untimely death, I think that a halt should be called on this subject, important as I consider it to be. Important though it is, there is great danger that much harm may come from reckless exploitation before sane views have clarified the atmosphere.

RECKLESS SACRIFICE OF THE DENTAL ORGANS.

It was not right that so important an organ as the ovary should be sacrificed, unless there was good reason for it. It was not so serious that people lost their appendices, except that some suffered from it physically or financially. But to sacrifice teeth is a very serious offense unless we can show good reason for it. If some of those who are over-enthusiastic had their way, the world would be a race of edentulous creatures—and what would become of your profession, gentlemen? After the eruption of the second teeth, your work would soon be done. All you would have to do would be to make plates!

I saw, a few years ago, a young woman who had organic disease of the heart, a mitral regurgitation. She had consulted a dental surgeon, who, I believe, regards himself as a specialist on the subject of root infection and similar conditions, and

he had told this young woman she was in serious danger of having a reinfection of her already damaged heart, and would possibly perish unless she got rid of her teeth. I make due allowances for exaggeration on the part of this young woman, though I know of no one in whose trustworthiness I should have greater confidence. She said he insisted on the removal of all her teeth—as healthy-looking a set of teeth as I have ever seen. She has now been in France for four years, and has done an enormous amount of the most trying work, under the most trying circumstances. She has been at the very front—was at the front before our soldiers were over there—and she is still at the front, and has never suffered even inconvenience, much less those dire consequences that were foretold.

This is a long preamble, but it seemed necessary because we hear a great deal of loose talk about the teeth and the desirability of getting rid of them.

HISTORY OF OUR PRESENT CONCEPTIONS: WM. HUNTER'S VIEWS.

Now, to come down to the topic itself: If we go back twenty years we find descriptions in medical textbooks of certain diseases that are no longer recognized nor referred to in the textbooks of the present day. I was brought up, and some of the rest of you, no doubt, also, at a time when we talked a great deal about "simple continued fever" and "ephemeral fever." They have disappeared from textbooks. Why? Because at about that time it began to be recognized that these were not distinct diseases, but merely the expression of infection somewhere in the body. That was the beginning of the thought that local infections might be the foci of disseminated infection simulating general diseases like typhoid fever. After a while various parts of the body were recognized as favorable seats for such local and hidden infection; among others, the region of the appendix, the pelvis of the kidney, the gall-bladder, the seminal vesicles, the prostate gland, and the bursæ around joints.

Eventually the accessory sinuses connected with the nasal chambers, the tonsils, and, last of all, the roots of the teeth, came to be looked on as sites where one might expect such focal infection.

Before, however, the importance of focal infection was much discussed, there was a good deal said (and this applies to my student days) about the effect of dental conditions upon the general health, in another sense; that is, that bad dentition leads to bad mastication, bad mastication to under-nourishment. It was also thought that infected conditions in the mouth, such as gingivitis, might lead to the swallowing of pus with the food, thus producing gastro-intestinal and perhaps general infection. It is only recently that attention has been paid to the roots of the teeth as localities from which general infection could occur. One of the first persons who called attention to the possibility of dental conditions' being the underlying cause of joint disease was William Hunter of London. A number of years ago, in the *American Journal of the Medical Sciences*, he wrote a paper which greatly impressed me at the time. In it there was mentioned the case of a woman who had begun to suffer with arthritis of the deforming type; and Hunter found, under the plate of her artificial teeth, a badly ulcerated condition. He removed the plate, treated the ulceration, and was gratified to find that the arthritis almost immediately began to vanish, the patient being finally cured altogether. That was the first definite pronouncement of the relationship between dental conditions and chronic joint troubles, so far as I know. Hunter extended his views in later years, and is nowadays more especially known for his views concerning the relation of the mouth to pernicious anemia. In his opinion, there is a disease of the tongue, supposedly a specific infection, that is the underlying basis of pernicious anemia. This last is a little foreign to the present discussion, but I wanted to mention it as bearing on the question of focal infection.

After Hunter, others pursued this

question of the relation of mouth infections to various kinds of disease. Regarding the types of infectious disease in the mouth I hesitate to speak, for I shall expose my ignorance to you—who, of course, know about these affections in a far more detailed way than I have any means of knowing. But, looking at the matter roughly from the average medical man's standpoint, we have to deal with cases of superficial infection, conditions like gingivitis or pyorrhea, and with the deeper infections more properly designated as root abscess. The former of these are much less important so far as the general condition of health is concerned and are far less frequently the source of generalized infection than are the deep-seated, hidden, and incarcerated abscesses about the roots of the teeth.

SYSTEMIC INFECTIONS OF ORAL ORIGIN AS RELATED TO THE PERIOD OF LIFE.

Now, the oral infections, if I may use the larger term, that give rise to general infections of the body are different at different periods of life. You will see few cases of general trouble, or the diseases which I am going to enumerate for you, from the conditions about the teeth in childhood and early life, as compared with cases due to infections about the tonsils, in the pharynx, and perhaps in the accessory sinuses. When anyone tells me that he has, in a young person before the age of thirty or, still worse, before that of twenty, a case of general infection due to a root abscess, I immediately grow skeptical; but, on the other hand, in the involutional period of life, in the forties, fifties, and sixties, root abscesses become increasingly important. Infections of the soft tissues are most to be apprehended in youth; it is infection of the alveolar process that we should look for as the age of forty is passed.

With regard to the particular diseases that are due to oral or dental infection, I could, without any misstatement, enumerate infective inflammation of practically every part of the body, and sundry other conditions recognized as attribut-

able to infectious toxemia. One of my friends asked me recently to read the manuscript of a textbook article he had written on the subject, and I found that he had made just such an enumeration—one, indeed, that might have formed a first-rate index to a textbook on medicine. I wrote that I thought it would be better for him to pick and choose from among these many possible conditions those that were important or common. So it is the things that have importance because they are serious conditions, or because their dependence upon hidden sources of infection are apt to be overlooked, that seem to me specially worth mentioning. Among these I desire to speak particularly of the following:

- I. Chronic anemia.
- II. Chronic arthritis.
- III. Chronic nephritis—Bright's disease.
- IV. Myocarditis; that is, weak heart.
- V. Recurrent or relapsing endocarditis—or infection of the heart valves.

I. CHRONIC ANEMIA.

Chronic anemia is a disease that, until comparatively recently, was not very clearly understood by medical men. In the books published up to ten or fifteen years ago, "chronic anemia" was put down as a definite disease somehow dependent on a vice in the blood-making function, but without any clearly recognized cause. Now we search for causes, and know that chronic anemia is usually secondary to some poisoning, infection, or obscure loss of blood going on in the body. We have all seen individuals in our families or among our friends, who would repeat the familiar formula—"I was always fed on iron since I was a little girl." These are the cases put down as "chronic anemia," and cases in which today, among other causes we ought to be searching for focal infection. When we deal with those beginning in childhood we are likely to find that they are due to tonsil or sinus infection, or infections of some part of the pharyngeal cavities. Later in life, when we see an

indefinite anemia even approaching pernicious anemia in type and severity we shall not infrequently find it due to root infections. I have seen some very notable examples of this sort of thing, and want to allude to one—a very striking one.

A number of years ago I was asked to take charge of a lady who was returning from Europe. She had become very ill in Florence, and had got worse and worse; they had called in celebrated physicians, who studied her case and decided that her manifest anemia was due to cancer of the stomach. Her son then went to Europe and took her to Carlsbad, where the diagnosis was confirmed. She continued in about the same state, and it was finally decided to bring her back to America. I do not think I have ever seen a more anemic-looking person than she was when she arrived. She was as white as chalk, and had a hemoglobin percentage of less than 30. After some study I concluded that she did not have cancer of the stomach; but she did have some very bad root abscesses, which had been discovered in London, just before they brought her to this side. These were cleared up by removal of the teeth, with the result that there was an extraordinary improvement almost immediately, and eventually a return of her blood to normal. She was then almost seventy years of age, and lived several years longer.

There are many elderly people who have not a disease that you can give a name to, but who are in a chronic state of ill health. They are, as a matter of fact, suffering from focal infection somewhere in the body. These people are usually anemic. They have what we call technically a secondary anemia. It is important to search for the cause—in the oral cavity, among other places.

II. CHRONIC ARTHRITIS.

The second condition I mentioned is chronic arthritis. This is sometimes, as Hunter first showed, due to focal infection; but all arthritis is not, by any means, due to that. Our first knowledge

of the relation of the mouth to arthritis was the discovery made that true articular rheumatism is commonly due to infection entering through the tonsils. That the forms of chronic arthritis called "deforming arthritis" are frequently due to oral infection is undoubtedly true; but a belief that this is the invariable cause may lead to errors of interpretation. It may, for example, lead the physician to the hasty conclusion that a certain case of chronic joint disease is deforming arthritis, and infective in nature, when as a matter of fact the joint disease is gout. Every person with deformed joints has not chronic arthritis, and gout is not an infectious disease. If we have the idea too strongly in mind that there is a bad tooth or an oral infection whenever we see joint trouble, we are likely to subject patients to needless extractions or other surgical procedures.

III. CHRONIC NEPHRITIS.

The textbooks are not very clear as to what causes many of the cases of chronic nephritis. The layman thinks it is largely due to heredity and very commonly to alcohol. The latter is a gross injustice to nephritics, because alcohol is by no means the all-important factor. Heredity, also, is an overworked theme. Modern investigators are beginning more and more to believe that chronic kidney disease is usually secondary to infection. We see this unmistakably in a person who has had scarlet fever and developed acute kidney disease from which he never entirely recovered, the nephritis having become chronic. The same is true in the case of pneumonia; but what we have not seen clearly is the origin of the cases of Bright's disease in which the patient comes to the physician without a history dating back to any acute infection. It is gradually dawning on the profession of medicine that a large proportion of these cases are due to the gradual effects of infection—not to one huge assault, but to repeated small insults, little disseminations of infection, day after day and week after week. Each one injures

the kidney, the great excretory organ of the body. The kidney is more and more damaged until the nephritis becomes obvious in the way of symptoms, and the patient consults a physician. Nothing is found in the history to indicate an initial severe infection; but there is good ground for believing that many cases, if recognized early enough, studied and treated from the point of view of focal infection as we study and treat cases of chronic arthritis, would be cured.

A gentleman once consulted me with this story: He was a lawyer in the central part of the state. He had gone to Hoboken to meet his son, who was returning from Europe. At that time he was in average health, as far as he knew; but as he was walking down the pier toward the steamer, he suddenly felt a pain in his back—and from that time on was a sick man. It was a year later when I first was brought into the case. He had lost forty or fifty pounds and his blood was reduced to 50 per cent. hemoglobin. He had the pain in his back, which was thought to be pleurisy and which we subsequently found to be due to arthritis of the vertebræ, with pains running along the intercostal nerves; he had albumin and casts and a high blood pressure. We found a wretched condition of the mouth. His teeth were literally swimming in pus. All of the tooth sockets were enlarged by the ulcerative process. We made X-ray studies of his teeth, and I had not the slightest hesitation in saying, "Take every one out." This was done, and in the course of several months the man recovered completely. He regained his weight and had no further symptoms of his vertebral arthritis; his blood returned to normal condition; his urine cleared up, and his blood pressure is now normal. This was a case in which the kidney disease was unquestionably a direct result of infection disseminated from the mouth.

IV. MYOCARDITIS.

Most people as they grow older have a weaker circulation. As we pass the half-century mark we say it is to be ex-

pected that if we climb a hill we shall pant a little. We carry a little more weight, and our heart muscle is not quite so good as it was. Perhaps we are a little too ready to accept what is common for the inevitable. The heart suffers enormously in any infectious disease—particularly in some, like rheumatism, diphtheria, and scarlet fever. But the heart muscle also suffers damage from slow infections that go on over a long period of time. So, as people get older, they sometimes allow the heart muscle to be damaged by infections they ought to look after. An important but not invariable source of such infection is the mouth. Dr. Babcock of Chicago has emphasized the importance of the relation of chronic gall-bladder disease to disease of the muscle of the heart. He is perfectly right. I do not wish it thought that the mouth is the only place to be considered when we have disease of the heart muscle, or any others of the conditions I have named. There are other places to be thought of, although not quite so much as the mouth and teeth.

Since I have turned farmer and have watched plants grow and trees die, I have been impressed with the explanation of why the mouth and teeth are so frequently the sources of infection. When you study the process of the death of trees attentively, you see that the fork of the tree, where the water rests after a storm, is the place that is first attacked by tree rot. In the same way, it is the unclean cavity of the mouth that gives the best opportunity for infection to enter the human body. It is for this reason that the mouth is so important, but it is not the only place through which infection can gain access.

V. RECURRENT ENDOCARDITIS.

Last of all, there is the question of recurrent endocarditis. I have told you about the young woman who had been foolishly advised to have all her teeth taken out, because of the danger of re-infecting the heart. That was foolish advice, but it is important to realize that anyone who has a damaged spot,

a "place of lessened resistance," has to take more care to avoid exposure to subsequent infection than does one who is in good health. People with valvular disease of the heart are always liable to reinfection of the damaged valve, and they should exercise the greatest care about the mouth, the pharynx, teeth, etc. When anyone with a bad heart consults me, I look at the teeth with the greatest solicitude, and urge that the patient look after the state of the mouth. If infection gets in there, especially if streptococcus viridans, whose frequent habitat is in the mouth, gains access it is prone to reinfect an already damaged heart.

ON ROOT ABSCESSSES.

Now I want to say a word or two on this topic: Does every root abscess necessarily imply generalized infection? This is an important question for your profession to answer, and I think that you should approach it with an open mind. The fact that a person has a root abscess does not necessarily imply that everything in the way of disease he has is due to this root abscess. A man may have an arthritis that is due to gout and also have an abscessed root; or a man with a root abscess may have an arthritis due to infection from some other part.

We hear a great deal of talk about the new manipulations that you have performed in the way of root amputation. I am not in a position to express an opinion concerning this procedure of root amputation; but if that is not a feasible operation, it is time to get busy on one that is. I do not think that we are going to suffer your profession to sacrifice teeth as largely as they have been sacrificed in the immediate past. It behooves you to discriminate between an abscess that is infecting the system and one that is not. One that is not can, perhaps, be drained and treated, and should be; for a tooth is a precious thing in my judgment, and I would not sacrifice one under any consideration, if I thought there was any way of saving it.

THE QUESTION OF DIAGNOSIS.

The next question is that of practical diagnosis. I hold this point of view: I do not think a dentist alone has any business to diagnose such cases, nor is it a question for the medical man alone. When patients with suspicious oral conditions come to me, I say, "I want you to consult your dentist," because I think it is a question for consideration from two points of view. When you remove a tooth, you have done a damage that you cannot repair. There are two different points of view—that of the medical man and that of the dentist; there should be a consultation between them, just as in certain operations, such as appendicitis, a surgeon and a medical man should consult. I hate to hear of a tooth being taken out, on the advice of either the dentist or the doctor, without a consideration of the point of view of the other.

The next question is: In the diagnosis, what are we going to rely on? There are some dentists, and more doctors, who think the superficial appearance of the gum and the teeth justifies them in thinking there is no trouble at the root; but there are gums that look so healthy one would not suspect the serious trouble that exists underneath. I do not think this occurs often, but it does sometimes.

The next question is that of the X-ray. We are apt to think lightly of our own opinion and very highly of the opinion of the man who works in a laboratory and sends us his report. In medicine it works out in this way: A physician gets a report from the board of health that the blood test shows evidence of typhoid. He immediately throws over his own conception of the case and makes a diagnosis of typhoid, because the laboratory workers say they got a positive reaction. If you know that a man has broken his leg and they say that he has typhoid, do not give up your own judgment that the patient has a broken leg. This sounds ridiculous; but I have seen in practice cases almost as ridiculous as that.

Many dental practitioners are taking their own X-rays. They are apt to accept as final and authoritative the X-ray finding. The X-ray plate is like a photographic plate; it can lie outrageously, if the picture happens to be taken in certain directions. I recently examined the plates of two of the best X-ray operators in Philadelphia, and both had absolutely overlooked a very evident dental condition, which was afterward recognized in a third study and corrected. I have seen an instance in which a bad place in the plate was thought to indicate a bad abscess that did not exist. We must be more skeptical concerning the work of the X-ray artist; we should be less complacent, and not accept it lightly when there is a tooth to be sacrificed.

In addition to being sure you have an X-ray study that you can rely on, there are general conditions of the patient's health to be considered. If the patient has abscessed teeth, he is likely to have some general indications or symptoms, provided the local disease has caused general infection. Unless we find these symptoms we ought, again, to be skeptical. The question comes down to this: Here is a plate that suggests a shadow around the root of a tooth. Are we to think an unexplained trouble, perhaps a very improbable one from the point of view of infection, is due to that? There is no kind of thing that men are not attributing to root abscesses. A patient develops iritis, glaucoma, or panophthalmitis. These are all manifestations that may mean gout, arterio-sclerosis, or syphilis; and yet someone is willing to say the condition is due to a root shadow, and he takes the tooth out. Teeth should not be sacrificed in this haphazard way; and, worst of all, the obsession that oral infections explain everything should not lead us to overlook much more serious conditions.

A FEW WORDS ON THE TREATMENT OF
ROOT ABSCESSES.

Now I am going to say a very few words regarding the question of treat-

ment. I have already expressed my opinion that the dental profession ought to be earnestly studying how they can introduce a conservative radical operation for such cases. I believe a root abscess wants drainage and cure. It cannot be dealt with tentatively. The long-continued treatment of root-canals seems very disappointing, but the extraction of the tooth is too radical a proceeding to be admitted as the last word on the subject. I hope root amputations are going to cure many cases by what I have chosen to call a conservative radical method.

A good deal has been said about the use of sera and vaccines. In the treatment of dental conditions they may sometimes be in place. In the case of the conditions that affect the soft parts around the teeth they may be useful, but I venture to predict that the end result of their use in the treatment of root abscesses will prove wholly unsuccessful. You might just as well treat an abscess embedded in a bone elsewhere in the body by this means as to treat root abscesses with vaccines. You may treat

gingivitis of various forms, and even pyorrhea, in this manner, and get results; but in root abscesses you deceive yourself in thinking you will get any result from that sort of treatment.

Finally, I wish to say that I am by no means a hopeless conservative so far as new points of view are concerned, and do not intend to convey the impression that I feel in opposition to the belief that unrelieved infections about the teeth may be a frequent source of widespread systemic disorder; but I wish to express as strongly as possible my opposition to unconsidered radicalism parading under the name of progressive treatment. When I see a culprit tooth that I think has been tried before a decent court, and without a packed jury, I believe in condemning it—and perhaps a whole set of teeth; but I dislike to see teeth sacrificed unless the condition has been openly canvassed and properly considered.

1728 SPRUCE ST.

[See also *Discussion*, as reported under "Proceedings of Societies," this issue.]

The Present Status of Teeth Without Vital Pulp.

By L. ASHLEY FAUGHT, D.D.S.

PROF. OPERATIVE DENTISTRY, PHILADELPHIA DENTAL COLLEGE.

(Read before the Eastern Dental Society, Philadelphia, April 17, 1919.)

THE great war is said to be over—and even now everybody is remarking that things are not the same as they were before the beginning of it. As one notable example, Dentistry has been moved into the limelight. Large demands have been made upon her, and largely has she answered to these demands. The M.D. has recognized the D.D.S., and under war conditions the two have clasped hands and worked side by side for the great cause of humanity. For the first time in history the hospital

cots had the names of the medical and of the dental attendants in charge of the cases posted side by side at their heads. Early recognition was attained that sound teeth were a factor of health; and of the converse, that diseased teeth produced and aggravated pathologic processes. No apology is therefore needed for the somewhat trite title of my paper, since the medical profession as a body is just commencing to realize the immense influence of such teeth in the production of systemic morbid conditions.

Among dentists the idea heretofore was that their preservation was considered advisable more with the view of preserving the patient's teeth and adding to the personal comfort and appearance than with any thought of thereby curing any very serious maladies.

There have ever been periods in dental history in which dentists turned thought and consideration to some one subject more pronouncedly than to others, and it may be well for us to consider with some care a topic which is at the present moment first in the minds of most practitioners of the day—the far-reaching effects of focal infections and the possible relation of teeth without vital pulps to systemic disorders.

The dental profession has for many years been insisting that the teeth were a very important portion of human anatomy, but this insistence for the most part fell upon unheeding ears so far as the medical profession was concerned. But now all things have changed, and it is at present the medical profession, with its long experience in surgical matters, that is reasoning by analogy. Pus from diseased bone has long been known by them to be the worst and most virulent type of pus. Pus, therefore, from and in connection with diseased teeth may be expected to possess the same undesirable characteristics. Teeth are not bones, but their roots have a distinctly bony covering, and the septic effects from absorption of toxins produce toxic neuritis, gout, chronic rheumatic arthritis, and a long list of other ailments in which even the heart is found to be included. The situation becomes truly alarming, and the status of teeth without vital pulps thrusts itself with insistence upon the dental profession, asking, How far, now, is their preservation to be considered advisable or even permissible?

Prof. J. Foster Flagg even in his day pointed out that nine in every ten "well-treated" teeth gave trouble in less than twenty years, this as a result most largely due to the length of time during which the alveolo-dental tissue had been doing double duty as a nourisher of tissue in contact with dead tissue—it being noted

that just in proportion as the effort to maintain integrity of dead dentin is perfect, so tolerance of such teeth is permitted for an indefinite and long period of time. The thought intrudes itself parenthetically that perhaps even today not more than five per cent. of all such teeth can be classed as "well treated." The trouble with such teeth, when it comes, is not with pulpless teeth, but from "pulpless" teeth still containing a sufficient quantity of very objectionable pulp.

Dentists have rung every change in the gamut, and technical skill has become most essential and far more general than formerly. The X-ray has come as a decided help and also as the avenging angel. Pathologists are by its showing disturbing the serenity of mind in which we have formerly rested, even when expert work is accomplished and—according to all previous reliable standards of judgment—"all is well."

The clinical history of the patient suffering from some one of the aforesaid legion of systemic troubles, coupled with that outline given above of the analogous conception on the part of the authoritative members of the healing art, together with the knowledge that bacterial disturbances are the cause of most modern diseases, points to an exhaustive examination for some positive focus of infection. Rare indeed after the thirty-fifth year of life is the mouth in which the physician will fail to find one or more of these teeth without vital pulps, and which, to say the least, may quite properly be looked upon with suspicion. Apparently normal, but under the all-seeing eye of the X-ray the physician condemns them to the forceps. As I have pointed out by my quoted statement of Professor Flagg, serviceable they may be from a purely dental standpoint, but normal—even when "well treated"—never. Is there not, therefore, often great justification for the decided status given to them by our medical friends? Our own Professor Garretson stated, "A diseased tooth may express itself in almost any part of the body."

For our study tonight a diseased tooth

may mean one without a vital pulp, as the converse of Professor Garretson's statement is being more and more insisted upon by the medical profession, that disease in any part of the body may find its origin in the existence of these teeth. I wish you also to note that while we all recognize "oral sepsis" as a "cause of septic gastritis, toxic neuritis, and other septic conditions," we are not in any way including this phase in our study, but concentrating our thought absolutely upon a diseased tooth as meaning one without a vital pulp, and I use this phrase because it cannot be properly named in any other way. As has been pointed out in our opening consideration, if the term "pulpless" tooth indicated correctly the existing condition, then there would not be any justification for physicians giving the status to these teeth which they are now so largely doing, nor any reason for the writing of this paper; the old status would do. I am brought, however, to see that the old status will not do. Physicians have at last come to see a light, and it is not for the dentist to now dispute facts which he has so long known and so long tried to have the family physician know and act upon. Developing knowledge of bacteriology has turned the tables. The dentist is not seeking the aid of the medical man to back up dentistry in its claims to importance before the public. The medical man now is at one with the dentist—fully recognizes the importance of these claims, and is daily advising his patients to accept and act upon them. Let the dentist not be puffed up in foolish pride, but readjust his bearings and be also at one with the physician.

In these days of conservatism and high professional dental skill, is it not quite possible that we go beyond the true mark?

In the long years of development to attain this high pitch, have not our minds and the minds of our patients accepted as truth and fact what at first was and still very well may be only ideal?—the indefinite preservation of every

tooth. Not for one moment am I advocating the swing of the pendulum to the opposite extreme—not even anywhere near it—but it should be recognized—

That the usual period of service of these teeth, "well treated," is not over twenty years.

That even such long service is dependent upon the vital force of the patient.

That such teeth are never normal organs.

That nature always stands ready to sacrifice the comparatively unimportant part for the general welfare of the whole economy.

That because dentists feel competent to treat and therefore to force the issue for the retention of these teeth, is no good reason why it should be done.

In view of all this, the status of teeth without vital pulps is today open to serious consideration. While operative dentistry has been advancing by giant strides, so too has prosthetic dentistry moved up to reliant capabilities and to a point of high service to humanity.

The conclusion, therefore, is that when treatment of teeth without vital pulps can be instituted as a *primary* effort, and readily succeeds in placing these teeth in further service, answering perfectly *any* test, it should be done; but that any *secondary* effort, involving patient, extended, and trying effort both to patient and to dentist, is inadmissible. The prompt extraction of teeth and their replacement by prosthetic means is by far the better practice, and the only real safeguard to the present and future health of the patient.

While I am not sure that all my *confrères* will say amen to this, I am positive that no dissenting voice will be heard from the medical profession; but that as a unit they will concur with it as a statement of a perfectly sane, safe, and sound procedure. Any other attitude of mind obstructs progress, and holds dentistry upon a narrow plane.

MEDICAL ARTS BLDG.

Concerning Gold Inlays.

By H. E. TOMPKINS, D.D.S., New York City.

MUCH has been said of gold inlays. Much more can be said of gold inlays, and the technique of their making, before perfection has been attained.

This contribution is *intended* to clear up a few points, but it may induce more argument. It deals with the behavior of the various materials used in the making of gold inlays, under heat, as usually displayed by the direct method, and by casting into a cold mold from which the wax has been previously burned.

One principle of nature is that all matter, solid, liquid, or gaseous, expands when heat is applied to it; and, conversely, all matter contracts when heat is withdrawn. Another principle is that matter expands at a definite rate and to a definite amount. The rates have been discovered and are called the coefficients of expansion.

The method of ascertaining coefficients of expansion is, in general, as follows: A rod of the material, of given diameter and length, has its ends cut, squared, and polished. It is placed in a measuring device which is contained in a chamber or room in which the temperature is under control. Observations of a control temperature (usually $20^{\circ}\text{C}.$) and length are made. Further observations as to length are made at certain specified temperatures. Then an average of the changes noted is struck, and for general purposes this average is the coefficient of expansion of that material.

So the coefficient of expansion of a material is the average rate of expansion per inch of length, per degree of rise of temperature; therein we have *linear* expansion. *Square* expansion is twice the linear, for two directions of expansion are noted—in length and in width. *Cu-*

bic expansion is three times the linear, for in this three directions are found—length, width, and thickness.

Let us illustrate these. Fig. 1 demonstrates linear expansion, for expansion occurs from a middle point *c* toward the

FIG. 1.

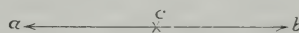


FIG. 2.

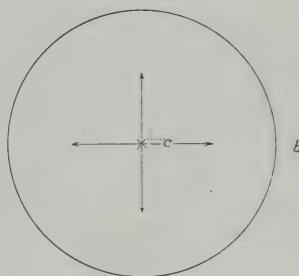
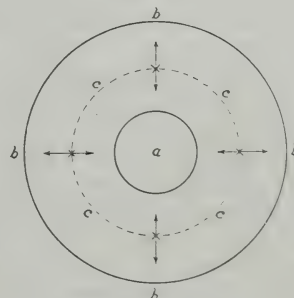


FIG. 3.



ends *a* and *b*. Thus the line becomes longer. Fig. 2 illustrates both square and cubic expansion, which occurs in *all* directions from the central point *c*.

Fig. 3 describes an anomaly. Here a plate or disk of material with a hole in its center is shown. When heat is ap-

plied, an expansion occurs toward the central hole *a* and toward the periphery *b* from a line of middle centers, *c*. The periphery expands and becomes larger. The central portion expands and causes the central hole *a* to become smaller—in other words, the material expands into the cavity. Now, this is especially true if the periphery *b* is held at a constant or nearly constant temperature. This figure is depicted and described because it represents a flask of investment material from which the wax has been burned, and because the expansion of the investment material has been ignored heretofore.

Gold melts at 1913° F. Its coefficient of expansion per degree F. is 0.00000816.

Investment compound, composed of three parts silicic acid (silex) and one part plaster of Paris, has a coefficient of expansion of 0.0000063875.

The wax melts at about 160°, and its coefficients of expansion are—

From 32° to 61°, 0.00005944;

From 62° to 100°, 0.00007222;

From 101° to 140°, 0.00026444 (140° appears to be the highest measurable point). However, the expansion from 93° upward interests us—and only from that temperature, as will be shown later; so we strike an average from 93° to 140°, and we find that the coefficient in that range is 0.0002377.

The above are demonstrable facts. We must have other facts, and these we must assume.

Average room temperature is 68° F. Mouth temperature is 84° (found by striking an average between body or exhaling temperature (98.6°) and inhaling or room temperature (68°). Tooth cavity temperature is 93°, arrived at by allowing for loss of 5+° by radiation. The average size of an inlay is roughly a cube of $\frac{1}{4}$ inch. Of course the size and shape varies, and while it may contain as much gold as a cube of $\frac{1}{4}$ inch, yet its various dimensions differ at every point, and, naturally, both the inlay and the pattern are much distorted (microscopically) by any change in temperature.

Each equation recited below will be figured as of $\frac{1}{4}$ inch. Each will be worked

out as of linear measures, and the cubic measures will be figured as three times the linear. Some of the assumed facts, perhaps, are subject to criticism, but the results will be close enough to be called exact.

Now, since gold melts at 1913°, its temperature has been raised 1913 — 68, or 1845°. The coefficient of expansion of gold being 0.00000816, the gold expands

$$1845 \times 0.00000816 \times 3 \div 4 = 0.01129065.$$

On casting, the gold is poured as a liquid into the mold, and as it exactly fits the cavity while liquid, it contracts precisely the same amount that it expanded. So a casting of a $\frac{1}{4}$ inch cube of gold is 0.01129065 in. smaller than the model or pattern was. Hence a correction must be made therefor in manipulating the investment or wax.

This molten gold at 1913° comes in contact with the walls of the cavity in the investment, and so, before the gold has solidified, its heat has radiated to and raised the temperature of the investment by about 700° for a distance of about $\frac{1}{8}$ inch, and before the gold has completely set, this heat, together with that of fusing the gold, has radiated through the entire investment, and we can safely assume that 500° is its average increase in temperature. We further assume that the line of middle centers is $\frac{1}{4}$ inch away from the cavity walls. Thus we have an expansion into the cavity to consider, which we figure thus:

$$500 \times 0.0000063875 \times 3 \div 2 = 0.00479062$$

Further correction is necessary because of the expansion of the material into the cavity, which gives us a mold that is 0.000479062 smaller than we had at 68°.

In the preparation of a wax pattern in the mouth, the wax is heated to about 140° and then worked into the tooth cavity. It is allowed to cool to the cavity temperature, removed for correction, returned to the cavity, and forced to place once more. The wax has dropped in temperature from 140° to 93°. A correction may be made at this stage for

the resulting difference in size by adding more wax to the pattern, which is afterward trimmed and carved to its proper shape, removed from the tooth, and allowed to cool.

In spite of any efforts we may put forth, a shrinkage equal to a drop of at least 10° occurs in the wax in the cavity. This error *cannot* be corrected, for if the pattern and the casting were an *exact* fit, it would be impossible to remove the pattern from the cavity, and equally impossible to insert or remove the casting into or from the cavity. Still this error should be recognized as such, and we term it a "tolerance of error."

Did you ever fit an inlay into its cavity easily, and then pull and tug to get it out, and perhaps not succeed? The inlay went into the cavity at room temperature, and was warmed by radiation to tooth cavity temperature, consequently it expanded to a very tight fit. *Ergo*, reduce the swelling of the gold with cold water, and remove the inlay as easily as it went to place.

We are now ready to invest the pattern and to correct as far as possible the contraction of the gold and the expansion of the investment. Our total correction is the total expansion of the gold plus the total contraction of the investment, or

$$0.01129065 + 0.00479062 = 0.01608127.$$

The only way this correction can be made is by raising the temperature of the wax on investing. So we find the number of degrees required by dividing the amount of the correction necessary by the cubic expansion of the wax per degree; thus,

$$0.01608127 \div (0.0002377 \times 3 \div 4) = 22.49,$$

which represents the number of degrees it is necessary to raise the temperature of the wax above the point at which the pattern was made,

$$93 + 22.49 = 115.49^{\circ},$$

or the temperature at which the investing of the pattern should be performed.

But a further correction is necessary even here. We have raised the tempera-

ture of the investment nearly 50° . The investment, being heated, is in an expanded state. On cooling to 68° it contracts away from the pattern to this extent,

$$0.0000063875 \times 50 \times 3 \div 2 = 0.000479062,$$

which requires a correction of

$$0.000478062 \div (0.0002377 \times 3 \div 4) = 0.6^{\circ},$$

and this correction must be made by deducting this amount from the investing temperature, and so we have an ultimate temperature of 114.89° , at which we are to hold the invested pattern until the entire mass is set.

THE DATA OF EXPERIENCE.

All of the preceding part of this paper consists of scientific facts, theoretical and practical, and all of it is practically incontrovertible.

But I was talking with Jones the other day about expansion and contraction of inlays. Jones said, "Why, you have been making the things for years and never thought of expansion, yet you seemed to get accurate fits."

That is true. I have made inlays since 1907. The percentage of accurately fitting inlays has been high. That fact leads us to wonder why.

Is the fit of an inlay so accurate that it holds itself in a cavity? and does it, because of its accurate fit, protect the tooth or cavity from further decay? If not, what does hold an inlay in place? and what does protect the cavity from further decay?

A chorus answers to the first question, "No." To the second, "Cement." Perhaps the cement does have something to do with the work in hand. Let us see.

In the manufacture of cement the fused zinc oxid is placed in ball mills and ground for a given length of time until the result is a very finely divided powder, which is then bolted through silk. The siftings comprise the cement powder of commerce. Its grains are measurable, and are found to be approximately from 0.00029 in. to 0.00058 in. in diameter.

Now, a mix of cement, at the beginning of the mixing, is a chemical solution of the powder and the liquid, but as more and more powder is added, it becomes a physical union. Therefore the thinnest possible smear of properly mixed cement will be of a thickness slightly greater than the diameter of the powder grains.

My tests have proved that the thinnest smear obtainable in my hands, and at what I consider a proper consistence, measures from 0.00058 in. to 0.00079 in. in thickness. Such an extremely thin smear of cement has no strength, nor can such a thin film of cement be obtained in the setting of an inlay in the mouth, as sufficient pressure for properly working the inlay into its seat cannot be produced.

Since an inlay is held in a properly prepared cavity in three directions, we must multiply the thickness of cement by 3, thus:

$$0.00079 \times 3 = 0.00232 \text{ in.}$$

This is the average thinnest layer of cement possible to hold an inlay in place. Its strength and resistance is absolutely theoretical and problematical. It is my actual belief that a thickness of cement at least five times that specified is necessary to properly give the service required.

If that be true, we are just about where we started, before the gold and other materials began to expand and contract. We are justified, under the

circumstances, in concluding that the edges of a cavity should be beveled, whether the reason therefor be termed *camouflage* or protection of the enamel rods. The beveled edges *will* make it possible to hide the cement line, and *will* protect the enamel rods.

However, do not lose sight of the fact that the investing must be performed with some heat, and that heat is tooth-cavity temperature, or 93°—for, if you remember, it was from that point that we started with our completed wax pattern.

Note.—Anyone wishing to verify the figures noted in this paper, is at liberty to have the Bureau of Standards make complete tests, which they are quite willing to do, at a very reasonable fee. Consult them for any chemical or physical problem.

REFERENCES.

- (1) "Chemical Technology and Analysis of Oils, Fats, and Waxes." 3 vols.; 4th ed. By Dr. Julius Lewkowitsch. London: Macmillan & Co., 1909.
- (2) "Civil Engineers' Pocket Book." By A. S. Frye. New York: D. Van Nostrand & Co., 1913.
- (3) "Kent's Mechanical Engineers' Pocket Book." New York: J. Wiley & Co., 1916.
- (4) DENTAL COSMOS.
- (5) U. S. Bureau of Standards, Dept. of Commerce, Washington, D. C.
- (6) Smithsonian Institution, Washington, D. C.

2105 SEVENTH AVE.

Report of Committee on Dental Science and Literature.

By L. PIERCE ANTHONY, D.D.S., Philadelphia, Pa.

(Presented before the Pennsylvania State Dental Society at its annual meeting, Pittsburgh, April 29, 1919.)

IN making a report on the current literature of dentistry, the principal difficulty that confronts your essayist is the question of elimination. There is no lack of literature on all the subjects of interest to dentists, but the obvious necessity for placing a limitation on such a report compels us to pass many excellent articles with but slight reference. The object of the report then becomes an effort to guide the reader to the literature which may be of particular interest, and only attempting so much of a review of the contributions on the various subjects as will stimulate a desire for a more careful reading and study of the writings referred to herein. If the report shall in the slightest degree succeed in stimulating such a desire on the part of any of its hearers, the effort of your committee will have been fully justified and compensated.

ORAL SURGERY.

No subject before the profession of dentistry today is receiving more thought and attention than that of Oral Surgery, and the voluminous literature on this subject as the result of the world war should, and we believe will, stimulate an interest in this branch of dentistry which will eventuate in placing it on a firmer basis and attract to the specialty a greater number of adherents.

The most notable contribution of the year to this branch is the report of the Inter-Allied Dental Congress⁶ held in Paris in 1917, which was published early in 1918. The report comprises the work

of the prominent oral surgeons of the Allied armies in the hospitals of France, and is an encyclopedia of knowledge of the latest that is known in this field both from the surgical as well as the mechanical aspect of treatment of injuries of the jaws.

In the *Journal of Surgery and Gynecology*, Major R. H. Ivy⁷ published a review of the literature of the subject of oral surgery quite extensive in its scope and briefly reviewing the literature from a medical aspect. The reader is referred to this article for a comprehensive bibliography of the work on oral surgery as developed in the war hospitals of Europe as well as in America.

One of the most beneficial results of the war to dentistry has been the realization and acknowledgment by the medical profession of the necessity for collaboration between the dentist and the surgeon in the treatment of jaw injuries, and the results obtained from such collaboration have fully justified the claims which dentistry has long made that would result therefrom. Material advance has been made in the matter of bone-grafting for the restoration of jaws which have been mutilated and where large portions of the jaws have been shot away. The oral surgeon has been quite active in this work as well as in the field of plastic surgery, alone and in collaboration with the plastic surgeon. Major Blair,³ Major Brown,⁴ Major Ivy, Major Eby, Lt. McCauley,¹⁴ Kazanjian,⁸ Lyons,¹¹ Cole and Budd,⁵ and others have done conspicuous work in this field.

In the May issue of the DENTAL COS-

MOS appears the first instalment of a report of the treatment of some 200 cases of "Ununited Fractures of the Jaw" by Lieut. McCauley,¹⁴ in which some splendid results have been attained in the treatment of injuries which were partially treated in Europe and later in the Base Hospital at Cape May, N. J.

The writer only recently had the privilege and pleasure of visiting the Base Hospital at Fort McHenry, Maryland, and seeing some of the remarkable results of the treatment of jaw injuries in which there has been close collaboration between the dentist and the plastic surgeon.

Our recent surgical war experience has brought forth more prominently than ever the value of interdental splints in the treatment of fractures. Aiguier,¹ Moufang,¹³ Capt. Campbell, Eng., Villain,^{17 18} and others have devised some unique designs and methods of making splints. The principal feature emphasized in this connection is the necessity for a splint that will allow easy feeding of the patient, or one made in two parts so that the jaw can readily be opened when necessary, and such necessity often arises for operative purposes as well as for the comfort of the patient.

Much valuable literature on this subject has appeared in French, mainly in *La Restauration Maxillo-faciale*,¹⁰ a journal which began publication soon after the beginning of the war and devoted exclusively to surgery of the head, mouth, and jaws.

Several textbooks on oral surgery have appeared during the year, notably Martinier and Lemerle,¹² Keyes,⁹ Roberts,¹⁵ Brown,⁴ and Blair.³ In the latter work, edited by Major Blair, who has done yeoman service in this field during the war, it is regrettable that the third edition was published too early to include a full exposition of his experiences and the more recent developments in war surgery. These, however, are reviewed quite fully and well up-to-date in the journal issued by the Division of Head Surgery under the direction of the Medical Corps of the Army.¹⁶

LOCAL ANESTHESIA.

The year has brought forth much literature on this subject, mostly devoted to the exploitation of methods of producing conduction and infiltration anesthesia, mostly modifications of and improvements on the method originally introduced into this country by Fischer. The great demand for novocain in the army and its consequent scarcity in civil practice stimulated the manufacturers to produce other drugs for this purpose, several of which are reported to be quite as satisfactory as novocain. Judging from the amount of literature on this subject and the general reports of success in its use, conduction and infiltration anesthesia are growing more popular in the general practice of dentistry as an aid to painless operations. Smith,²⁵ Silverman,²⁴ Riethmueller,²² Blum,²⁰ Mallett,²¹ Beck,¹⁹ Shields,²³ Snyder,²⁶ and others have made contributions to this subject, Shields and Mallett describing the use of apothecin and procain, the new synthetic preparations, and Blum a paper on accidents from the careless and indiscriminate use of conduction anesthesia.

PERIAPICAL INFECTIONS.

The subject of periapical infections, notwithstanding the voluminous amount of literature and research on it, still is one of the most serious problems before the profession. We regret to record the fact that the pendulum of rationalism has not yet shown any sign of swinging back to what we hoped was the normal point; instead, we are more confused than ever as to the proper course to pursue in the treatment of devitalized teeth, and the seemingly hopeless divergence of opinion as to the proper method of procedure does not afford a great deal of encouragement. Indeed, to the writer the whole subject is so shrouded in a veil of uncertainty that indications seem to point to the profession arriving at the conclusion that all teeth which have suffered from periapical disease should be removed from the mouth. It is tragic

to contemplate the consequences of such a conclusion to the profession of dentistry, but an occasional ray of light appears on the dental horizon in the form of a method or technique for treatment of such teeth that offers some tangible shred of hopefulness.

Nodine⁴⁰ boldly states that teeth which have become devitalized are a constant menace to health and should be removed, and there are many who agree with him, notably Novitzky.⁴¹ Talbot,⁴⁵ in a series of experiments on animals, proves almost conclusively that any and every operation in the sphere of dentistry may set up a condition in the periapical area which considerably increases its susceptibility to infection. Best,²⁷ Crane,³² Howe,³⁷ Buckley,²⁸ Prinz,⁴³ and Cameron²⁹ have devoted their energies to perfecting a technique by which a great majority of teeth which have been diseased may be saved to the patient. Howe reports continuing success by the use of the silver nitrate solution, and Prinz has devised a technique for the use of dichloramin-T which promises to be highly successful. We must soon arrive at a technique that will enable us to treat devitalized teeth successfully, or face a veritable revolution in the entire practice of dentistry.

Mayo,³⁸ Hartzell,³⁵ Price,⁴² Duke,³³ Cotton,³¹ Grieves,³⁴ and Howe³⁶ have continued their researches on the relation of oral infection to systemic disease, and all have tended to confirm more strongly the conclusions they previously reached. Grieves and Howe alone of those mentioned present what may be considered a moderately conservative view toward the subject.

The greatest aid to the operator in determining the conditions about the apices of treated teeth has been the radiograph, and the only one which appears to offer any degree of certainty in determining periapical conditions. McCoy,³⁹ Thoma,⁴⁷ and Raper⁴⁴ have shown very clearly the extent to which we can rely on the X-ray as a diagnostic aid, and a careful study of their work leaves hardly a leg for the rabid X-ray enthusiasts to stand upon—those who

attempt to diagnose oral, systemic, or any other disturbance simply from a reading of the dental X-ray film.

CROWN AND BRIDGE WORK.

The procedure to be followed in crown and bridge work is so necessarily dependent upon the final judgment as to the question of disposition of devitalized teeth that we can hardly hope for any startling developments in this branch until we have definitely disposed of the root-canal problem. The most conspicuous work in this field has been done by Goslee,⁵¹ Chayes,⁴⁹ Burgess,⁴⁸ Orton,⁵³ Gormsen,⁵⁰ and Nesbett,⁵² their attention being focused more particularly on a discussion of the relative merits of fixed and removable bridge work. The importance of being able to maintain a hygienic condition in the mouth seems to be the basic argument in favor of removable bridge work, while those who stand for fixed bridges, notably Burgess, have in their favor the bugbear of the great maze of uncertainties we are liable to wander into in destroying the pulps of teeth to afford proper abutments for removable bridge work—Burgess, particularly, relying upon pinlays and hood forms of attachment for fixed bridge work, and thereby avoiding the destruction of the pulp. Nesbett offers as substitutes for both fixed and removable bridge work as commonly understood, the use of clasp bridges, by which he too avoids the destruction of pulps and the consequent potentialities for evil.

PROSTHETIC DENTISTRY.

Conspicuous advance has been made in this specialty, stimulated doubtless by the uncertainty of the conditions which may be developed from focal infections and augmented greatly by the attitude of the medical profession toward diseased teeth, in an effort to meet new conditions in this field. Essig,⁵⁵ Orton,⁵⁸ Hall,⁵⁶ Supplee,⁶² House,⁵⁷ Campbell,⁵⁴ Paterson,⁵⁹ Todd,⁶³ Wilson,⁶⁵ Weiss,⁶⁴ and Snow⁶¹ have made particularly valuable contributions to the literature of pros-

thetic dentistry. Hall's efforts have been in the direction of developing an anatomical articulator and a complete and precise method of making artificial dentures, from the taking of the impression to the finished denture, which we consider one of the greatest advances made in recent years in prosthetic dentistry. Essig's energies have been devoted to a systematization of tooth forms as related to temperament, which is the result of years of study of this particular phase of prosthetic dentistry. Supplee has done much to exploit what is called the "closed mouth" method of impression taking and muscle trimming, a modification of the Greene method which has been so generally adopted by the profession.

The literature of the year represents what the writer⁶⁰ has previously referred to as the greatest progress in this branch of dentistry made since the time of Bonwill.

PYORRHEA.

This specialty of dentistry has produced its usual amount of literature during the year. The most noted advance in this line in recent years has been the organization of the American Society of Periodontology, a group of men banded together with the aim of systematizing the treatment of Pyorrhea, and for further study and research into its etiology and treatment. Roy,⁷⁰ Smith,⁷¹ Stillman,⁷² McCall,⁶⁹ Hopewell-Smith,⁶⁷ Merritt,⁶⁸ Elander,⁶⁶ and others have contributed noteworthy to the literature. Roy's article has impressed the writer as being one of the most valuable contributions in recent years to this subject. Roy in his classic contribution arrives at the conclusion which Talbot for years has held, namely, that pyorrhea is the result of a senile atrophy in a transitory structure and an inevitable physiological process. Smith again energetically champions his theory that a reattachment of the soft tissues to the cementum may be brought about as the result of proper treatment.

The feature of note in this field is that the great majority of men who specialize

in the treatment of pyorrhea seem agreed that the most effective treatment is from the local aspect, some even ignoring entirely the systemic aspect. The praiseworthy efforts of the above-mentioned society to formulate a definite system of nomenclature covering this specialty are worthy of note.

ORTHODONTIA.

The study of the etiology of malocclusion, as in years past, has occupied considerably the attention of orthodontists. Hellman⁷⁶ and Johnson,⁷⁷ present valuable and instructive studies of this phase of orthodontia. Weinberger's⁸³ interesting "History of Orthodontia" is still being published serially in the *International Journal of Orthodontia*. Rogers⁸⁰ has presented in a very attractive manner the value of muscle training as an adjunct to the orthodox treatment of malocclusion. Hannau,⁷⁴ Stanton,⁸¹ and Sved⁸² have presented further studies in the application of engineering principles to the correction of malocclusion. Mershon,⁷⁹ Lourie,⁷⁸ Hawley,⁷⁵ and Case⁷³ have presented valuable contributions in the development of appliances; Mershon and Lourie the so-called "lingual arch," an appliance for treating malocclusion from the lingual aspect of the arch, and Hawley a retention appliance. Both of these we consider noteworthy additions to the mechanical aspect of orthodontia.

ORAL HYGIENE.

The subject of oral hygiene has assumed even greater importance than ever. The prevalence of dental disease, the insufficient number of dentists to care for it, the uncertainty attending the treatment of devitalized teeth and their use as supports for bridge-work substitutes, together with the increased knowledge of the evils of focal infections on the part of the public and the medical profession, has inevitably resulted in focusing the attention of the profession on a means of preventing dental disease. The greatest hope for results in pre-

ventive dentistry, we believe, lies in education, public school clinics, and prophylaxis persistently pursued by the dentist with the aid of the "dental hygienist." The writer⁸⁸ has previously called attention to the need for the dental hygienist if we are to meet the demands made upon the profession by the public and the medical profession, and it is to be hoped that Pennsylvania will soon follow the lead of other states in legalizing the dental hygienist. Fones,⁸⁴ ⁸⁵ Ferguson,⁸⁶ and Hyatt⁸⁷ have made valuable contributions to the literature on this subject during the year.

The question of care of the dental disease of the public has been brought so forcibly to the attention of the health authorities in England as the result of the inability of the legalized profession in England to care for the needs of the public because of the small number of legalized dentists, that it has been recommended by a Royal Commission⁸⁹ that public clinics be established throughout the kingdom to combat dental disease from the preventive aspect, and for the dissemination of information to the laity on oral hygiene.*

RESEARCH.

The Research Foundation of the National Dental Association has been continuing its work during the year, and the results have been more in the nature of confirming work previously done. Price,⁹⁶ ⁴² Hartzell,⁹² ³⁵ Prinz,⁹⁷ ⁴³ Talbot,⁴⁵ Horel,⁹³ K. Dewey,⁹¹ Marshall,⁹⁵ Howe,³⁶ ³⁷ and Lee⁹⁴ have done considerable research work during the year, particularly in the line of asepsis. It is worthy of note that the Dakin preparation,⁹⁰ Dakin's solution (hypochlorite of sodium) and the chloramins, have been applied to dental uses. Prinz⁴³ claims wonderful results in the treat-

ment of apical infections by means of the dichloramin-T preparation. Horel gives an exhaustive series of experiments with the Dakin preparations in the treatment of mouth conditions without very convincing results, attributed by the author to the lack of favorable clinical material for experimentation.

As an indication of the increasing interest being manifested by the profession generally in research, it is with considerable pleasure that we note the action of the Ohio State Dental Society in establishing a permanent research fund as a memorial to the late lamented John R. Callahan in recognition of his unselfish devotion to the advancement of dental science.

Another notable and hopeful development in the research field is the announcement of the publication of the *Journal of Dental Research*, a quarterly journal to be devoted solely to the publication of dental research work under the supervision of Wm. J. Gies of New York, the journal to succeed the *Journal of the Allied Dental Societies*, which ceased publication in September of last year.

LITERATURE (BIBLIOGRAPHICAL).

There have appeared during the year a number of reviews of current literature which we record here as a further bibliographical aid to readers who wish to avail themselves of this valuable assistance in referring to the literature on the various subjects. Bunting,¹⁰⁰ Clement,¹⁰¹ Ivy,⁷ Black,² Anthony,⁹⁸ and Bebb⁹⁹ deserve particular mention, Bebb's article being historical rather than dealing with current literature, as do the others mentioned.

In closing, we wish to express our regret at the discontinuance of the *Dental Review*, which has for so long a time been a highly respected and greatly appreciated contemporary. The passing of the *Dental Review*, under the able editorship of our honored *confrère*, Dr. C. N. Johnson, is a distinct loss to the dental profession which we sincerely deplore.

Because of time and space limitations,

* [The report referred to (on the working of "The Dentists Act, 1878") was recently published as presented to Parliament. This important State paper, epoch-making for British dentistry, was reprinted, unabridged, in the DENTAL COSMOS for June 1919, pp. 425-602.—ED.]

this review is necessarily brief and incomplete, but we hope that a sufficiently comprehensive review of the literature has been given to enable the reader to readily follow the leads to the literature of the various specialties of our calling, and to further facilitate this we have arranged the accompanying bibliography under the respective subject headings.

BIBLIOGRAPHY.

ORAL SURGERY.

1. AIGUIER, J. E. "Improved Method of Casting Splints." *DENTAL COSMOS*, July 1918.
2. BLACK, CARL E. "Military Plastic and Oral Surgery." *Journal of the N. D. A.*, January and March 1919.
3. BLAIR, V. P. "Surgery and Diseases of the Mouth and Jaws." Third ed.
4. BROWN, G. V. I. "The Surgery of Oral Diseases and Malformations." Lea & Febiger, 1918.
5. COLE and BUDD. "Bone-grafting in Fracture of the Mandible." *Brit. Med. Journal*, January 18, 1919.
6. "Transactions Inter-Allied Dental Congress, Paris, 1917."
7. IVY, R. H. "War Injuries of the Face and Jaws." *Surg., Gynecol. and Obstetrics*, August 1918; *DENTAL COSMOS*, November 1918.
8. KAZANJIAN, V. H. "De la prothèse dans le traitement des Lésions des parties molles de la Bouche et de la Face." *La Restauration Maxillo-faciale*, November 1918; *Dental Summary*, March and April 1919.
9. KEYES, F. A. "Army Dentistry." D. Appleton, 1918.
10. *La Restauration Maxillo-faciale*, Paris, France.
11. LYONS, C. J. "Fractures and Dislocations of the Jaws." *Dental Summary*, January 1919.
12. MARTINIER and LEMERLE. "Injuries of the Face and Jaw." Wm. Wood & Co., 1918.
13. MOUFANG, A. N. "A Suggestion for Making Splints in Two Parts." *DENTAL COSMOS*, November 1918.
14. MCCAULEY, D. H. "Treatment of Ununited Fractures of the Jaws." *DENTAL COSMOS*, May [and June] 1919.
15. ROBERTS, J. B. "War Surgery of the Face." Wm. Wood & Co., 1919.
16. "Survey of Head Surgery." Office Surgeon-general, Washington, D. C.
17. VILLAIN, G. "Traitement Physiologique des Fractures Mandibulaires." Transactions Inter-Allied Dental Congress, Paris, 1917.
18. *Idem*. "Boite Maxillo-faciale." *La Restauration Maxillo-faciale*, September 1918.

ANESTHESIA.

19. BECK, H. M. "Novocain Infiltration Anesthesia in the Everyday Practice of Dentistry." *DENTAL COSMOS*, April 1919.
20. BLUM, THEO. "The Teaching of Conductive Anesthesia." *Journ. of the N. D. A.*, July 1918.
21. MALLETT, S. P. "Procain for Dental Operations." *DENTAL COSMOS*, October 1918.
22. RIETHMUELLER, R. H. "Causes of Failures and Untoward Results in Conductive Anesthesia." *Dental Summary*, August 1918.
23. SHIELDS, J. S. "Apothesin, the New Local Anesthetic." *DENTAL COSMOS*, April 1918.
24. SILVERMAN, S. L. "The Status of Apicoectomy." *Journ. of the N. D. A.*, March 1918.
25. SMITH, A. E. "Nerve Blocking." *Dental Review*, November 1918.
26. SNYDER, D. P. "Conductive Anesthesia and Orthodontia." *Dental Summary*, December 1918.

PERIAPICAL INFECTIONS.

27. BEST, E. S. "Appliances, Instruments, and Technique to be Used in Pulp-canal Operations." *Journ. of the N. D. A.*, February 1919.
28. BUCKLEY, J. P. "The Treatment of Pulpless Teeth, and the Technique of Cleaning and Filling the Canals." *Journ. of the N. D. A.*, May 1918.
29. CAMERON, S. P. "To What Extent Can Tooth Structures be Sterilized Immediately with Dilute Solutions of Formalin?" *Dental Summary*, October 1918.
30. COOLIDGE, E. D. "Diagnosis and Treatment of Conditions Resulting from Diseased Dental Pulp." *Journ. of the N. D. A.*, April 1919.
31. COTTON, H. A. "The Role of Focal Infections in the Psychoses." *New York Med. Journal*, March 1919.
32. CRANE, A. B. "When Shall Root-canals be Filled, and How?" *DENTAL COSMOS*, December 1918.
33. DUKE, WM. W. "Oral Sepsis in Its Relationship to Systemic Disease." C. V. Mosby Co., 1918.
34. GRIEVES, C. J. "A Review of the Clinical Data Relative to Efficiency of Various Root-filling Methods." *Journ. of the N. D. A.*, February 1919.
35. HARTZELL, T. B. "Review of the Relative and Actual Efficiency of Medicaments for

Sterilization of Tooth Structures." *Journ. of the N. D. A.*, January 1919.

36. HOWE, PERCY R. "The Treatment of Root-canals by a Silver Reduction Method." *Journ. of the N. D. A.*, October 1918.

37. *Idem*. "To What Degree are Oral Pathological Conditions Responsible for Systemic Disease?" *DENTAL COSMOS*, January 1919.

38. MAYO, C. H. "The Control of Focal Infections." *DENTAL COSMOS*, November 1918.

39. MCCOY, J. D. "Dental and Oral Radiography." C. V. Mosby Co., 1918.

40. NODINE, A. M. "The Radical Treatment of Focal Infections from a Military Point of View." *DENTAL COSMOS*, March 1919.

41. NOVITZKY, JOSEPH. "Dead Teeth." *Amer. Journ. of Surgery*, February 1919.

42. PRICE, W. A. "Report of Laboratory Investigations on the Physical Properties of Root-filling Material and the Efficiency of Root-fillings for Blocking Infection from Sterile Tooth Structures." *Journ. of the N. D. A.*, December 1918.

43. PRINZ, H. "Sterilization of Root-canals." *DENTAL COSMOS*, December 1918.

44. RAPER, H. R. "Dental Radiography." Consolidated Dental Mfg. Co., 1918.

45. TALBOT, E. S. "Bone Absorption Around the Roots of Teeth." *DENTAL COSMOS*, May 1919.

46. THOMA, K. H. "Chronic Diseases of the Mouth." *Dental Summary*, January 1919

47. *Idem*. "Oral Roentgenology." Ritter & Co., Boston, 1917.

CROWN AND BRIDGE WORK.

48. BURGESS, J. K. "Nature's Tolerance and Compensating Adjustments as Related to Efficient Dentures." *DENTAL COSMOS*, September and November 1918.

49. CHAYES, H. E. S. "Cast Gold and Porcelain Inlays." C. V. Mosby Co., St. Louis, 1918.

50. GORMSEN, L. "Mobile Bridges." *Dental Items of Interest*, February 1918.

51. GOSLEE, H. J. "Clasped Partial Dentures vs. Bridge Work." *Dental Items of Interest*, March 1918.

52. NESBETT, N. B. "A Simple Form of Removable Bridge Work with Cast Clasps." *DENTAL COSMOS*, March 1918.

53. ORTON, F. H. "Standardization in Crown and Bridge Work." *Dental Summary*, March 1919.

PROSTHETIC DENTISTRY.

54. CAMPBELL, D. D. "Why Measurements of the Mandible, Tracings of the Condyles,

etc., are Non-essential to the Construction of Full Dentures." *Journ. of the N. D. A.*, March 1918.

55. ESSIG, N. S. "Type vs. Temperament in the Selection of Teeth." *DENTAL COSMOS*, February 1918.

56. HALL, R. E. "Retention of Full Dentures." *Dental Review*, December 1918.

57. HOUSE, M. M. "A Scientific Technique in the Construction of Artificial Dentures," etc. *Journ. of the N. D. A.*, December 1918.

58. ORTON, F. H. "Color of the Teeth." *Dental Summary*, April 1919.

59. PATERSON, A. H. "Careful Technique the Greatest Factor in the Construction of Full Upper and Lower Dentures." *DENTAL COSMOS*, October 1918.

60. "The Re-revival of Dental Prosthesis." Editorial, *DENTAL COSMOS*, February 1919.

61. SNOW, GEO. B. "The Conversion of India Rubber into Vulcanite." *DENTAL COSMOS*, September 1918.

62. SUPPLEE, S. G. "Classification of Tissue Conditions in the Mouth as Related to Efficient Dentures." *DENTAL COSMOS*, November 1918.

63. TODD, B. B. "Modeling Compound as an Impression Material for Full Dentures." *Dental Summary*, August 1918.

64. WEISS, O. A. "Articulation in Artificial Dentures." *Journ. of the N. D. A.*, April 1919.

65. WILSON, G. H. "A Manual of Dental Prosthesis." Lea & Febiger, Philadelphia, 1917.

PYORRHEA.

66. ELANDER, KARL. "Principles Governing the Construction of Permanent Fixatures in the Treatment of Pyorrhea Alveolaris," etc. *DENTAL COSMOS*, August 1918.

67. HOPEWELL-SMITH, A. "Normal and Pathological Histology of the Mouth." P. Blakiston's Son & Co., Philadelphia, 1918.

68. MERRITT, A. H. "The Pathology, Etiology, and Treatment of Pyorrhea." *DENTAL COSMOS*, July 1918.

69. MCCALL, J. O. "Primary Factors in the Etiology of Periodontoclasia." *DENTAL COSMOS*, December 1918.

70. ROY, M. "The Pathogenesis and Prophylaxis of Pyorrhea Alveolaris." *DENTAL COSMOS*, August and September 1918.

71. SMITH, T. SYDNEY. "Some Biological, Physiological, and Clinical Problems in the Treatment of Septic Foci." *Journ. of the Allied Dental Societies*, December 1918.

72. STILLMAN, P. R. "The Human Mouth in a State of Health." *Dental Items of Interest*, August 1918.

ORTHODONTIA.

73. CASE, C. S. "A Case from Practice." *Dental Items of Interest*, February 1918.

74. HANNAU, R. L. "Photo-Surveys of the Human Denture." *Dental Items of Interest*, June 1918.

75. HAWLEY, C. A. "A Removable Retainer." *DENTAL COSMOS*, June 1919.

76. HELLMAN, M. "Artificial Feeding and Its Bearing on General Disturbances and Malocclusion of the Teeth." *DENTAL COSMOS*, February 1919.

77. JOHNSON, A. L. "The Nature of the Orthodontic Problem." *DENTAL COSMOS*, May 1918.

78. LOURIE, L. S. "The Concealed Labial Arch Wire with Spring Extensions." *Dental Items of Interest*, April 1918.

79. MERSHON, J. V. "The Removable Lingual Arch as an Appliance for the Treatment of Malocclusion of the Teeth." *Internat. Journ. of Orthodontia*, November 1918.

80. ROGERS, A. P. "Exercises for the Development of the Muscles of the Face," etc. *DENTAL COSMOS*, October 1918.

81. STANTON, F. L. "Engineering Principles Applied to Dentistry." *DENTAL COSMOS*, April 1918.

82. SVED, A. "The Application of Engineering Principles for the Predetermination of Arch Outlines." *DENTAL COSMOS*, January 1919.

83. WEINBERGER, B. W. "History of Orthodontia." *Internat. Journ. of Orthodontia*, 1918 and 1919.

ORAL HYGIENE.

84. FONES, A. C. "Technic of Dental Prophylaxis for the Dental Hygienist." *Journ. of the N. D. A.*, February 1918.

85. *Idem*. "An Educational and Preventive Dental Clinic in the Public Schools of Bridgeport." *Journ. of the N. D. A.*, February 1918.

86. FERGUSON, H. W. "A Child's Book of the Teeth." World Book Co., Yonkers, N. Y., 1918.

87. HYATT, THAD. P. "An Interesting Study of 2787 Radiographs Taken from 1140 Patients in the Dental Section of the Metro-

politan Life Insurance Company." *Dental Items of Interest*, July 1918.

88. "Preventive Dentistry and the Dental Hygienist." Editorial, *DENTAL COSMOS*, March 1919.

89. "Report of Committee on the Extent and Gravity of the Evils of Dental Practice by Persons Not Qualified under the Dentists Act." *British Dental Journal*, March 1, 1919. [See footnote on page 637.]

RESEARCH.

90. DAKIN, H. D., and DUNHAM, E. K. "A Handbook on Antiseptics." The MacMillan Co., New York, 1917.

91. DEWEY, KAETHE. "Cysts of the Dental System." *DENTAL COSMOS*, July 1918.

92. HARTZELL, T. B., and DIEHL, H. S. "The Effect of High Pressures on Bacteria." *Journ. of the N. D. A.*, April 1918.

93. HOREL, RUTH F. "The Use of Hypochlorites and Chloramins in Dentistry." *DENTAL COSMOS*, May 1919.

94. LEE, W. E. "Dichloramin-T: Points in Use." *Annals of Surgery*, January 1918.

95. MARSHALL, J. S. "Study of Human Enamel with Special Reference to Its Nutrition." *Dental Items of Interest*, March 1919.

96. PRICE, W. A., and POND, S. E. "Electrolytic Medication." *Journ. of the N. D. A.*, June 1918.

97. PRINZ, H. "Diseases of the Dental Pulp." *DENTAL COSMOS*, April and May 1919.

LITERATURE (BIBLIOGRAPHICAL).

98. ANTHONY, L. P. "Brief Review of Current Dental Literature." *DENTAL COSMOS*, April 1918.

99. BEBB, WM. "A Bibliography of Dental Journals Published in the United States and Canada." *Journ. of the N. D. A.*, March 1919.

100. BUNTING, R. W. "A Review of Dental Literature: 1917-18." *Journ. of the N. D. A.*, August 1918.

101. CLEMENT, G. B. "Report on Dental Science and Literature." *DENTAL COSMOS*, January 1919.

Diseases of the Dental Pulp.

IV. Treatment.

By HERMANN PRINZ, M.D., D.D.S., Philadelphia, Pa.

(Continued from page 387.)

1. The Exposed Healthy Pulp and Its Treatment.

THE modern treatment of a wound from a surgical point of view centers about two primary objects—the removal of all necrosed tissue and establishing asepsis. Clinically, all wounds must be looked upon as being infected. If the infection is not restricted to the surface but has penetrated into the deeper structure, drainage and antiseptics are employed.

An exposed healthy pulp, which in reality is a wound, must always be looked upon as being infected. In conformity with the difficulties as elucidated in a previous chapter regarding the treatment of an infected pulp the normal surgical aspect of the operation is completely upset. The prime requisite for any interference with the dental pulp is a thorough knowledge of its anatomical relationship. In many instances, the unintentional opening into the pulp chamber is avoidable. If it does occur it is primarily caused by unhappy circumstances or by an atypical structure of the pulp, and in the hands of the experienced operator these accidents are to be classed as comparatively rare occurrences. The density and *not* the color of the involved dentin is the safe guide to follow during the process of excavating the cavity. It is to be understood that the tooth is always placed under the rubber dam. Careful inspection of the cavity with a sterile explorer and a magnifying glass is indispensable. Sterilization of the cavity with a suitable antiseptic lessens the danger of acci-

dental infection. If the pulp is exposed, direct access offers a greater chance for its conservative treatment than an inaccessible cavity; in the latter instance the operator should lose no time in devitalizing the pulp. If the pulp is still covered with a protecting layer of dentin, an effort should be made to preserve this covering, provided the diagnosis of the respective condition of the pulp justifies such a procedure. These cases are treated as outlined under "Hyperemia of the dental pulp."

"Pulp capping," as this process of applying a protective medium to the exposed pulp is technically known, will always remain, relatively speaking, an operation of chance, even under the very best possible conditions. Nevertheless, the writer cannot subscribe to the supposed authoritative statement of certain practitioners, namely, that pulp capping is always a failure.

The practice of capping exposed pulps was introduced by Leonard Koecker in 1826.

ETIOLOGY.

Exposure of a pulp may be caused by trauma, such as fracture of a tooth, cavity preparation, etc., or it may occur as a sequence of pathologic disturbances, *i.e.* caries, erosion, abrasion, corrosive acids, etc. The former accidents usually reveal a sound pulp, while in the latter cases an infection of the pulp may be expected. The term "partially exposed pulp," which is occasionally employed to designate a condition in which the intervening layer of dentin is very thin,

is a misnomer, as the pulp is *not* exposed. In reality, all clinical exposures of the pulp are partial in their nature, as the pulp is never exposed in its entirety.

INDICATIONS FOR CAPPING A HEALTHY EXPOSED PULP.

The indications for "capping" a healthy pulp, *i.e.* covering the exposed pulp with a protective aseptic material, may be summarized as follows:

(1) Only perfectly healthy exposed pulps which are not wounded, or only very slightly, offer suitable cases for this operation. A healthy exposed pulp has a pink color; an inflamed pulp appears as a bluish-red pulsating tissue, trying to protrude through the broken pulpal wall.

(2) The healthy pulps of deciduous or permanent teeth whose roots are not fully completed offer the best chances for capping. Pulp growth denotes functional activity, *i.e.* physiologic hyperemia, hence such pulps exhibit marked properties of repair.

(3) The pulps in the teeth of advanced adults and those pulps which show signs of degeneration are not suitable for capping. The latter usually undergo atrophic changes and are ready to succumb at the slightest provocation.

(4) Pulps in fully formed teeth exposed by caries, erosion, abrasion, etc., and those exposed by revolving engine burs, should never be capped.

Pathology. An exposed pulp practically always denotes infection. The control of an infection of the exposed pulp does not lie within the power of the operator; as yet, there are no remedies at our command which will eradicate an infection without producing some injury to the delicate structure of this organ. In doubtful cases the safest policy is always to devitalize at once.

The strict observation of the following prerequisites as applied to the operation of pulp capping will largely govern its ultimate success:

(1) Asepsis of instruments and of the field of operation.

(2) Careful protection of the exposed pulp against drying out and future infection.

(3) The application of a suitable aseptic capping material without the slightest pressure.

(4) Ready accessibility of the exposure.

PULP-CAPPING MATERIALS.

The materials advocated for the purpose of capping exposed pulps vary greatly; the more important ones are:

(1) Depressed metallic disks or foils, platinum, gold, lead, etc.

(2) All dental cement with the exception of the silicates, preferably zinc oxysulfate cement (Fletcher's artificial dentin).

(3) Gutta-percha in substance or in solution.

(4) Mixtures of zinc oxid with thymol, phenol, oil of cloves (eugenol), iodoform, etc.

(5) Various substances, *i.e.* cork, asbestos, rubber dam, paper, mica, celluloid, paraffin, etc., either as such or medicated or in combination with an adhesive.

(6) Numerous proprietary preparations.

A pulp-capping material should possess the following properties:

(1) It must be non-irritating.

(2) It must be a non-conductor of temperature.

(3) It must be readily adaptable and applicable without the slightest pressure.

(4) It must be non-putrefactive.

The rationale embodied in the process of pulp capping consists in applying an inert aseptic cover over the exposed pulp to protect it against further irritation. In due time the pulp will close up the break in its chamber wall by depositing secondary dentin.

In conformity with the requirements, the selection of a suitable pulp-capping material is a comparatively simple matter. Many of the substances advocated, especially the concentrated antiseptics and certain cements, are directly harmful. Such compounds as formaldehyd, zinc chlorid, phenol, creasote, etc., when

applied pure or in concentrated solutions, are caustics, and will invariably destroy the pulp. Even the repeated application of oil of cloves to the exposed pulp will eventually cause its death. The statement is frequently made that an exposed pulp under a formaldehyd preparation or a zinc oxychlorid cement will remain quiescent. A pulp treated with these substances, when subsequently examined will, in the majority of cases, be found dead. The aseptic necrosed tissue at some future period usually gives way to gangrene.

TREATMENT.

As stated above, strong antiseptics must be rigidly avoided; the very delicate pulp is too easily injured by most of these substances. A pellet of cotton moistened with a $2\frac{1}{2}$ per cent. dichloramin-T solution is placed gently over the pulp exposure to act as a protective against infection, but primarily, however, to prevent its drying out. Irreparable shrinkage will occur if this phase of the operation is overlooked. The cavity is prepared with sterile hand instruments, the cotton pellet is removed, and the cavity is dried with a fresh piece of sterile cotton, but *never* with the warm air blast. A bit of pulp-capping material consisting of a mixture of two parts of zinc oxid and one part of thymol is taken up with a warm hoe-shaped instrument, carried to the edge of but *not* upon the exposure, and with a warm amalgam plugger, the material which has become plastic by heat is molded very gently and without the least pressure over the opening. The operator, especially the beginner, is cautioned against the use of a large quantity of capping material. Only enough should be employed to cover the exposure and its edges. The capping sets almost immediately. Some operators prefer to apply the capping upon a depressed metallic disk. Such disks may be obtained from supply houses or they may be readily made by burnishing a thin piece of metal with a ball-shaped instrument against a stick of soft pine wood. The

capping and adjacent dentin is now sterilized with a 50 per cent. thymol solution in acetone. After drying, it is coated with a veneer of creamy-mixed oxyphosphate cement. The cavity may then be occluded with a gutta-percha preparation or some other temporary filling material for further observation.

2. Hyperemia of the Dental Pulp.

Hyperemia is the presence of an increased amount of blood in the pulp. It may be of a physiologic or a pathologic type, and partial or total in its nature. Physiologic hyperemia denotes an increased influx of blood, while pathologic hyperemia results from a retarded efflux.

ETIOLOGY.

Hyperemia is the initial response of a tissue to an irritation. Only the pathologic type is of interest to us at this moment. Agents which favor sudden temperature changes, as carious defects, erosion, abrasion, etc., play a most important rôle. The late Dr. G. V. Black always emphasized the fact that hyperemia is very commonly the result of heat generated in polishing fillings, either by rapidly revolving disks, or by the vigorous drawing of tape back and forth on the approximal surfaces of the teeth. Large metal fillings or metallic inlays in deep-seated cavities are common causative factors. Preparing a sound tooth for a shell or jacket crown by grinding its enamel and setting the crown with an acid cement over the unprotected dentin is productive of a very severe chronic hyperemia. Electric shocks as a sequence of contact between an electro-positive metal, *i.e.* an amalgam filling, and an electro-negative metal, a gold crown, for instance, with an interposed electrolyte, *i.e.* saliva, and thus forming a completed circuit, are frequently observed. These electric shocks at times produce spasms of acute pain.

During severe cold weather, cases of obscure idiopathic hyperemia of the pulps of the upper and, rarely, of the

lower teeth are frequently observed. These very acute manifestations of pain are secondary disturbances and should be classified as borderline diseases of the teeth and their adjacent structures.

Disturbances of the vasomotor system of the bloodvessels of the pulp or direct irritation of these vessels is the primary cause of hyperemia.

PATHOLOGY.

The *clinical picture* of hyperemia of the pulp is portrayed by a patient complaining about a recent disagreeable sensation in a tooth, especially toward morning. Hot and especially cold fluids, or even a breath of cold air, produces a sharp pain. The tooth may have been recently filled or a cavity or some other form of abrasion of its enamel surface may be present. In the aged, senile atrophy of the alveolar process frequently exposes the roots of the posterior teeth especially, which, in consequence, become highly sensitive to temperature changes. Acute hyperemia of a physiologic type plays no part in our discussion; if it is caused by an irritant it is of very short duration, and usually disappears with the removal of its cause.

Pathologically, hyperemia in its chronic form is the most frequently exhibited type of pulp lesions; it is the progenitor of practically all acute or chronic diseases of the pulp. The hyperemic pulp, except in traumatic cases, is always covered with a more or less sound layer of dentin. During the later stages of caries, when this layer of dentin becomes softened, infection of the pulp is practically always to be expected. Chronic irritation of the pulp leads to a renewed activity of its odontoblasts, resulting in the deposition of calcium salts. Within the sound dentin this additional deposit produces the translucent zone of Tomes, *i.e.* a partial calcification of the dentinal fibers. When confined to the pulp proper the deposition results in adventitious dentin and pulp nodules. Pressure of these deposits may lead to chronic irritation and often to complete atrophy of the pulp. Hyperemia of the

pulp, histologically, manifests itself in the dilatation of all bloodvessels. As long as circulation continues the pulp will live. The anatomic structure of the pulp does not favor the establishing of collateral circulation; hence if the circulation becomes completely obstructed, stasis occurs which quickly leads to its death.

SUBJECTIVE SYMPTOMS.

On taking hot and, especially, cold fluids in the mouth, or from a breath of cold air, an unpleasant sensation is felt which manifests itself as a paroxysm of sharp pain lasting for some seconds, or a minute or two, only.

DIAGNOSIS.

The patient is always able to point to the affected tooth. The antecedent history accompanied by an inspection may reveal a recent filling, a carious defect, or some other form of abrasion of the crown, or an exposure of the root. The pulp is not exposed. The temperature test with cold water is quite positive, while change in the color of the tooth, percussion, palpation, and roentgenogram are usually negative. The hyperemic pulp shows a slight increase in its reaction to the faradic current.

A *differential diagnosis* between simple irritability and pathologic hyperemia may readily be established. If a pulp which has distinctively responded to cold water resumes its normal condition when the tooth is again surrounded by the physiologic fluids of the oral cavity, the condition should be classified as simple irritability. If, on the other hand, the pain or even an unpleasant sensation lasts for some minutes thereafter, we are entitled to speak of the condition as pathologic hyperemia.

PROGNOSIS.

Hyperemia of the pulp in its early stages usually responds favorably to conservative treatment. Under proper management resolution will occur in most cases.

TREATMENT.

The basic principle of the treatment of hyperemia of the pulp consists in the removal of the irritant, *e.g.* interposing a non-conductor between the focus of irritation and its outside source. In mild forms, suitable preparation of the cavity, its sterilization with a concentrated solution of thymol in acetone, the application of a quick-drying cavity varnish to act as an *insulator*, and restoration of occlusion with cement, either as a final filling or as an intermediate step prior to the insertion of a metal filling, is usually crowned with success. Severe cases require the application of antiseptic drugs sealed into the cavity with a temporary filling material. A gutta-percha preparation or a cement of the oxysulfate type (Fletcher's artificial dentin) is most convenient for this purpose. The selection of a suitable antiseptic is largely a matter of choice. Oil of cloves, liquid phenol, chloro-phenol, creasote, etc., either alone or combined, answer the purpose well. All of the enumerated agents exhibit, as a side action, local anesthetic and incidentally astringent properties. Existing pain which is the sequence of an irritation will be automatically eliminated by the eradication of its cause. The medication should remain in the tooth for twenty-four hours, and if need be it may be renewed. If a more efficient sedative compound is desired, a saturated solution of chloretone in oil of cloves deserves to be highly recommended.

Medicaments should not be sealed into a tooth in a haphazard manner in regard to time. Usually the medicament becomes exhausted in about twenty-four hours and must be renewed if further action is to be expected. To avoid disagreeable shock from sealing a medicament in a deep-seated cavity it should always be slightly warmed prior to its insertion. After the pulp has resumed its normal activity the cavity is finally sterilized and filled as described above, preferably with cement only, for a suitable length of time for observation.

Distressing cases of hyperemia of the

pulp are represented by those teeth in which, through senile atrophy of the alveolar process, a large part of the root is continuously exposed to temperature changes and irritation by foodstuffs. The palatine roots of the upper molars, and less often the roots of the lower molars, are primarily represented by this group. As these roots are not amenable to protection by a filling, the only therapeutic measure which promises relief is the application of silver nitrate in a concentrated solution. The soft tissues surrounding the exposed root are protected by a coating of vaselin or with a napkin, and the root is dried with cotton and warm air. A very concentrated solution of silver nitrate may be made by crushing a few crystals on a glass slab and adding a drop of water. With a thin spatula-shaped stick of orange-wood, the entire area is thoroughly coated, and if possible the tooth-root is exposed to direct sunlight for ten minutes, or by reflecting the light into inaccessible places with a mouth mirror. In due time an intense black color is obtained. The treatment should be repeated once or twice on alternating days. If some of the solution should accidentally come in contact with the soft tissues, a concentrated sodium chlorid solution should be applied at once. Sodium chlorid is its chemical antidote, and changes the silver nitrate into an insoluble silver chlorid.

The removal of enamel from a tooth with a living, healthy pulp by grinding, etc., preparatory to attaching a shell or jacket crown, in most instances produces a very painful reaction, *i.e.* an obstructive hyperemia of its pulp. If the operator decides not to destroy the pulp, it must be protected, prior to setting the crown with cement, against the future irritation of the cement acid, otherwise its death, in time, is almost certain to occur. A heavy coating of silver nitrate—until a jet black color is obtained, as described above—and coating the black stump with a suitable hard varnish, will restore the hyperemic pulp to its normal activity and protect it against future irritation.

3. Acute Simple Pulpitis.

ETIOLOGY.

Acute inflammation of the pulp is primarily caused by bacterial invasion, usually a streptococcosis of a mixed type, arising as a sequence of existing dental caries. Numerous other primary and secondary conditions, however, which have been discussed in detail under the subject of "Etiology of diseases of the dental pulp," play an important rôle as etiologic factors.

Clinically, only one variety is observed, *i.e.* acute simple pulpitis. Depending on its etiologic nature, clinicians occasionally refer to this disease in such specific terms as idiopathic, or traumatic, or toxic pulpitis, etc. The disease may manifest itself as a partial or a total pulpitis; the clinical differentiation between these forms, which is purely a quantitative and *not* a qualitative conception, is too hazy to permit of clearly distinctive diagnoses. Partial pulpitis always precedes the total involvement of the pulp.

CLINICAL PATHOLOGY.

The clinical picture of acute simple pulpitis is usually readily recognized from a description of the manifested pain as subjectively experienced by the patient. The tooth, in most instances, shows a carious defect or some form of deep-seated abrasion and can always be pointed out by the patient. In cases of idiopathic pulpitis the correct location of the involved tooth becomes more difficult. The pulp is not exposed except in certain traumatic cases.

PATHOLOGY.

Pathologically, acute simple pulpitis portrays the typical picture of an acute inflammation; it is always the sequence of a neglected obstructive hyperemia and is primarily caused by a bacterial invasion. It should be borne in mind, however, that an inflammation may be produced by purely mechanical (pulp nodules), thermal (rapidly revolving

disks), or chemical (arsenic) irritation without bacterial infection, and that aseptic inflammation with aseptic pus may be the result. The routine manifestations as they gradually develop during the inflammatory process in ordinary soft tissues as previously discussed must, of necessity, also take place in an inflamed pulp—with this vital difference, however: In the latter instance the cardinal symptoms of inflammation with the exception of pain cannot be observed. It should be borne in mind that a pulp may become diseased or may even die without manifesting the slightest sensation. Atrophy of the pulp, which, however, is not an inflammatory process, very frequently brings about such changes.

In very rare cases, a pulp may die as a sequence of some general disease, as leukemia, for instance, without manifesting any pain. Sclerotic nerve degeneration as it occurs in locomotor ataxia occasionally produces complete anesthesia of the dental pulp and subsequent painless inflammation and death. These disturbances are discussed under the subject of "Secondary pulpitis."

In the early stages of acute inflammation only that part of the pulp, usually a horn, which is located opposite the point of irritation, becomes involved. Consequently, the initial picture represents a partial pulpitis. Depending upon the severity of the irritation, the inflammation spreads rapidly, and a total pulpitis with its numerous pathologic changes is the chronological sequence of the intensely acute process, finally resulting in death of the pulp.

Acute pulpitis, in rare instances, terminates in resolution; in the majority of cases suppuration and gangrene is sure to follow. With the involvement of the apical tissues a long chain of secondary disturbances may be expected.

DIAGNOSIS.

The painful tooth, as pointed out by the patient, usually shows a carious defect or a traumatic lesion. On removal of the débris from the cone-shaped cav-

ity, a layer of discolored and more or less decalcified dentin is observed covering a horn of the pulp. The lightly passing explorer is not felt. On exerting pressure upon the decalcified pulpal wall a quick, painful response is obtained. Cold water produces a marked paroxysm of acute pain. The color of the tooth is not altered. Percussion, in the early stages of the inflammation, is negative; in the last stages of total pulpitis when the infection has passed into the periapical tissues, tapping the tooth with a steel instrument brings forth a painful response. Transillumination and roentgenogram are negative. The faradic current produces a marked sensory response from the diseased pulp which is far below the normal irritation point of the patient, indicating an acute inflammation. The more severe the inflammation, the less current is required.

A correct diagnosis of idiopathic pulpitis is usually fraught with great difficulties. In many instances the tooth shows no apparent extrinsic disturbances, although the true etiologic factor of this type of pulpitis, *i.e.* the growing pulp nodule, is much favored by mechanical causes, among which advanced cases of abrasion predominate. A roentgenogram may reveal pulp nodules, which, as stated, are always present, and thereby differentiate idiopathic pulpitis from hyperplasia (exostosis) of the cementum of the involved tooth. The pain as described by the patient is of a severe, acute, throbbing and lancinating character, and during the paroxysm, which lasts for a minute or two, the affected side of the face becomes flushed. The general character of the pain closely simulates facial neuralgia. Pathologically speaking, idiopathic pulpitis represents a type of true neuritis of the dental pulp. It is claimed that when a tooth responds very painfully on percussion during a cycle of pain, and this hypersensation passes off immediately after the paroxysm ceases, idiopathic pulpitis is to be suspected. Its pathognomonic signs are pulp nodules; however, the roentgenogram does not always reveal their identity.

In most cases of traumatic pulpitis the pulp is exposed; the rhythmic pulsation and a deep bluish-red color are observable pathognomonic signs of an acute inflammation. If the exposed pulp is pricked with a pointed instrument, a few drops of dark venous blood flow from the wound and the existing pain is much eased.

The quick response of the inflamed pulp to a low faradic current and the acute lancinating pain produced by the application of cold water, *diagnostically* differentiates acute simple pulpitis from other types.

PROGNOSIS.

A well-established acute simple pulpitis always offers an unfavorable prognosis for the preservation of the involved pulp. The peculiar anatomic structure and other characteristics of the latter tissue as discussed in the preceding pages do not favor a resolution of its diseased structure. The conditions which justify an attempt to conservatively treat an inflamed pulp may be summarized by stating that only cases in the very earliest stages of acute pulpitis should be selected for such a procedure, provided that the particular pulp is in a state of physiologic hyperemia, *i.e.* a young growing pulp. The destruction of the pulp is always indicated in cases of idiopathic and traumatic pulpitis.

TREATMENT.

The indications for the respective therapeutic measures in accordance with the decision of the operator as to whether an attempt should be made to conservatively treat an inflamed pulp or whether it should be destroyed at once, necessitate a separate discussion based upon the individual viewpoint. In both instances the initial preparation is the same, *i.e.* the tooth is placed under the rubber dam, the cavity excavated, sterilized, and a sedative antiseptic is sealed in it for twenty-four hours, and if need be, repeated. If a resolution of the pulp is anticipated, the further steps are exactly the same as outlined under "Treatment

of hyperemia of the dental pulp," *i.e.* the cavity is varnished, a veneer of zinc oxysulfate cement is placed over the affected pulpal wall and is finally covered with cement with a view to further observation. In case the pulp is to be devitalized, the initial treatment as referred to above (which should never be neglected) is followed by the surgical or therapeutic devitalization proper, in

which local anesthesia as a preliminary procedure is instituted, or arsenic is sealed into the cavity. Both methods are discussed under the caption "Devitalization of the pulp." The removal of the pulp in a case of idiopathic pulpitis does not require any further discussion; it is precisely the same as indicated above.

(To be continued.)

Pseudo-Hemophilia.

By Dr. L. R. GANS, New Haven, Conn.

FOLLOWING is the report of a case which may prove helpful in the treatment of cases of a similar nature. Mr. X—, age twenty-four, was referred to me for an X-ray of the lower left molar region, with history of excruciating shooting pains radiating along the left ear and temple. The X-ray film showed clearly an impacted lower third molar lying bucco-lingually, with cusps pointing toward the cheek.

Under complete conduction anesthesia with 1 per cent. novocain, the offending molar was elevated from its position after removing the overlying bone with mallet and chisel. All the necessary and essential rules of asepsis were strictly observed. After the removal of the impacted tooth the socket was washed with normal salt solution and lightly tamponed with iodoform gauze. Each day for three successive days the wound was flushed with KMnO_4 1 : 3000 followed by normal saline solution and the cavity again very lightly packed. On the fourth day the patient returned with trismus, considerable swelling at the site of the impaction, complaint of excessive bleeding and hemorrhage during the night, and expectorating a considerable amount of blood. Removing the gauze and picking off the superficial dark blood-clots,

the socket was gently washed with normal saline solution, and by the local application of the various hemostats I succeeded in controlling the oozing flow of blood, and then packed the socket quite tightly with plain sterile gauze. Having prescribed and given the necessary instructions for maintaining a clean and aseptic mouth, the patient was dismissed for two days.

On the third day the patient reported having again experienced the excessive hemorrhage during the preceding night. Suspecting a hemophilic condition, I thought it advisable to treat it as such, and so, in conjunction with his family physician, went over the case thoroughly, the patient having become quite emaciated from lack of sleep and proper nourishment. The physician thought it advisable to pack the socket hermetically if possible with sterile gauze saturated with thromboplastin. In conjunction with this I placed a four-thickness pad of sterile gauze over the area, and having instructed the patient to bite, I applied a modified Barton bandage and dismissed him with the usual instructions as to nourishment, cleansing, etc.

All was going well for three or four days, when the hemorrhage again manifested itself. This time the blood was

examined microscopically for the number of blood platelets, and by order of the physician general treatment was instituted. On report the blood was found normal. The physician recommended consultation with a surgeon, who after having examined the cavity thoroughly and gone over the different procedures we had pursued to control the supposed case of hemophilia, merely stated that a vein in the surrounding tissue had been partially severed, whereas had the vein been completely severed the intima of the bloodvessel and elastic tissue would have contracted and closed

the lumen until normal healing had taken place. Due to the partial excision of the vessel the natural stages for the healing of surgical wounds was impaired, hence the resulting pseudo-hemophilic hemorrhage.

The cavity was thoroughly opened, and after slight curetment a crucial incision was made at the base of the wound. A light packing of sterile gauze was inserted with the result that a perfect clotting and normal healing immediately set in. The wound is now completely closed.

COR. ELM AND YORK STS.

Root Amputation.

By JOSEPH LEVY, D.D.S., New York City.

ORAL SURGEON NEW YORK THROAT, NOSE, AND LUNG HOSPITAL; ORAL SURGEON
BETH ISRAEL HOSPITAL, NEW YORK.

(Read before the Harlem Dental Society, December 19, 1918.)

THE object of root amputation is to eradicate by conservative surgical procedure chronic affections and infections of tooth apices.

Much has been written upon the subject of systemic conditions caused by chronic periapical dental infection. Yet we think the etiology of these foci, together with their diagnosis and technique of eradication, is not clearly understood by the vast majority of physicians and dentists.

I will present a short *résumé* of the etiology and pathology of these lesions:

ETIOLOGY.

The cause of these lesions is principally due to infection through the root-canals, brought about in several ways; such as a putrescent pulp, irritating drugs, and injudicious instrumentation during root-canal operations. All these

irritate the apical peridental membrane, and inflammation follows. It is believed by some that a certain percentage of periapical infections are of hematogenous origin, but from clinical experience we find only a few cases of this kind which are due to traumatism.

PATHOLOGY.

Due to the irritations mentioned above, the peridental membrane in the region of the apex becomes inflamed. The accompanying phenomena of all inflammations take place, namely, hyperemia, stasis, emigration of leucocytes, and diapedesis of red blood-cells. In peridental inflammation, usually known as pericementitis, we have a great preponderance of polymorphonuclear cells.

The inflammatory process may terminate in several ways. If the resisting powers of the peridental membrane are

such that they can withstand the irritation, and if the irritating cause is removed, we will have a return to normal; but if the irritation continues and the resisting powers are lowered, the tissue will break down and result in pus formation, which, if accompanied by the other symptoms of acute inflammation, is known as the acute alveolar abscess.

If the cause is less intense, and is of long standing, a productive inflammation will ensue; the productive inflammation is a proliferation of the cells of the peridental membrane. As this phenomenon progresses, the pressure against the surrounding alveolus causes the alveolus to become gradually resorbed, and the space becomes filled with granulation tissue, consisting of polymorphonuclear leucocytes, fibroblasts, capillaries, and spindle cells. The whole mass, surrounded by a fibrous capsule, is termed granuloma.

This new growth is almost similar to the infected granulomata of tuberculosis and leprosy. Streptococci can be obtained from these dental granulomata in the majority of cases, because the causal agent is almost always of an infective nature.

The finding of capillaries in the granuloma has proven very important, and through these the bacteria and their products have direct access to the general circulation.

Associated with the formation of these granulomata is rarefaction of the alveolus and in some cases necrosis of the root apex; when these granulomata of long standing become enlarged, the central cells undergo a fatty degeneration, and in some cases cholesterol crystals are found. The fibrous capsule becomes thinner, and if the cavity is lined with epithelial cells we have a typical cyst.

BACTERIOLOGY.

What are the bacteriological factors? The commonest micro-organisms found in these chronic conditions are the streptococcus viridans, staphylococcus albus and aureus, and *M. catarrhalis*. Thoma has reported the presence of actinomycetes in two cases. Actinomycosis, which is a

parasitic, infectious, inoculable disease, first observed in cattle but also occurring in man, is characterized by the manifestations of chronic inflammation, with or without suppuration, often resulting in the formation of granulation tumors, especially about the jaws. The disease is due to the presence of a parasite—the “ray fungus” or actinomycetes.

CHANNELS OF ABSORPTION.

According to Billings, bacteria and bacterial toxins are carried through the blood and lymph stream; they gain entrance into the blood in three ways:

- (1) By passing through the stomata of capillary walls by a sort of osmosis.
- (2) By a growth of bacteria passing through the walls of bloodvessels.
- (3) By being carried into the blood stream by leucocytes. The bacterial toxins may also gain entrance into the blood by way of lymph vessels.

How readily absorption from dental focal infection takes place can be seen from the fact that granulomata being highly vascular makes it possible for bacterial products to have easy access to the blood stream; this process is aided by the pressure exerted by the surrounding bone.

Clinical experience has shown that endothelial tissue is mostly affected by absorption of toxic products of dental origin. Knowing that endothelium forms the superficial covering of the joints, pericardial and peritoneal cavities, it follows that organs lined with this tissue are mostly involved where dental focal infection is the cause of a systemic malady.

The cases of secondary infection vary, but the majority of them which come to our notice are of the following types:

- (1) Infectious arthritis or infectious rheumatism—acute infectious arthritis.
- (2) Intestinal disturbances, as septic gastritis and colitis.
- (3) Anemia and debility.
- (4) Cardiac irregularity.
- (5) Cases of mixed conditions, as a case of arthritis and iritis.

In our everyday practice we encounter teeth the apical membranes of which are diseased and in nearly every case infected with the bacteria of the streptococcus and staphylococcus variety. These periapical affections are found in various conditions—some as a chronic pericementitis, which at first shows a thickening of the peridental membrane in the periapical area; others of a later stage show fully formed granulomata; we also find apices surrounded with the tissues of cystic degeneration, and quite often developing into a cyst (radicular). When the apex becomes denuded of its peridental membrane, rarefaction of the apex takes place.

In treating pulpless teeth, the main object is to save the tooth by removing the infection and preventing reinfection.

Many of our leading practitioners claim that these periapical infections may be made to disappear by ionic medication and proper root-canal filling; nevertheless, clinical experience has demonstrated in many cases that, although the radiograph shows regeneration, it should not be accepted as a permanent cure, because subsequent radiographs have disclosed recurrence of these lesions.

Then, again, we encounter teeth whose canals have been treated according to the best technique but the apical lesion fails to disappear, and quite often continues to progress. As stated before, these affections nearly always harbor bacteria of a virulent variety and if they cannot be positively eradicated in every case by root-canal treatment we have a focus of infection.

Grieves, one of the most thorough investigators, in his article on dental periapical infection (see DENTAL COSMOS, January 1914) states: "There is to my knowledge no medicament nor method, germicidal, oxidizing, or electrolytic, that will revivify the pericemental apex. If it be vital, the tooth is healthy; if it be diseased, the tooth is next to doomed. This is the point in treatment where materia medica stops and good surgery begins."

After all that has been written by

Rosenow, Billings, and Mayo of the grave results of focal infections, can we disregard the necessity of their complete and positive eradication? This can be accomplished in two ways—either extraction and curetment or root amputation.

In extraction we sacrifice the tooth, and a useful member of the masticatory apparatus is lost. In root amputation we save the tooth and eradicate the infection. It is the conservative method, while extraction might be considered the radical method.

SELECTION OF CASES FOR ROOT AMPUTATION.

It must be understood that root amputation is not a cure-all. Cases must be selected in order to have good results.

The condition of the surrounding bone must be carefully studied; the shape of the root, and the extent of the affection from the apex to the cervical margin: if the apical end of the root apex must be amputated to such an extent that the remaining root will not have sufficient bone investment to give support for its firm retention the tooth is best extracted.

Unfavorable conditions are ever present. A tooth affected with chronic general pericementitis is unfavorable, especially when it has reached the stage of progressive resorption of the dental alveolus with accompanying suppuration. Teeth with marginal pus pockets generally spell failure. (Fig. 13.)

So far, we have considered the tooth in its immediate surrounding structure. Now we shall take up its position.

In the upper jaw the operation is less difficult than in the lower; there is less bleeding, and the area can easily be kept clear of saliva. The upper molars present difficulties which at times make the operation unfavorable, such as the palatal root extending far over in the palatal process toward the median line, while quite often the buccal roots extend into the antrum; the bicuspid frequently are crowded and also, at times, extend into the antrum. The canines, laterals, and centrals are, on account of their anatomical position, the most favorable.

In the lower jaw, the proximity of the roots of the lower molars to the inferior dental canal must be considered; also the thick outer plate of the bone. Regarding the bicuspid, we should not lose sight of the possible injury to the mental nerve as it issues from the foramen. The centrals and laterals call for extreme care, as they are generally very close together, and the roots taper to such a fine point that they are sometimes difficult to locate. Injury of adjoining teeth, if any, must be carefully guarded against. The canines, being most prominent in their bony investment, can be amputated with the least difficulty.

The first step after deciding upon root amputation is to remove the primary cause, *i.e.* to cleanse the root-canal and remove all the infected tissue. This, as we all know, requires a certain amount of skill and patience. After it is accomplished, the canal must be filled as near as possible to the apical foramen, or still better through the foramen, with gutta-percha. This is best done before the operation, as it helps in deciding how much root is to be removed and eliminates the possibility of reinfection.

A radiograph is taken just before the operation showing the canal and its filling. This must be carefully studied; the distance of the affection of the peridental membrane from the apex toward the cervical margin noted; the shape of the root, and its proximity to the adjoining roots and anatomical structures.

The operation consists in opening the outer plate of bone, exposing the affected area, amputating the root-end, and cutting the diseased bone; this must be thorough and strictly according to surgical principles.

INSTRUMENTS AND ACCESSORIES.

All necessary instruments, gauze sponges, applicators, iodine swabs, and materials for the operation must be ready and in their proper places. Of course it is understood that everything is sterilized; the towels are wrapped in muslin wrappers and sterilized at 270° F. for thirty minutes at 20 lb. pressure; the

gauze sponges and iodine applicators should undergo the same process. The tray should be covered with a sterile towel, upon which the instruments are laid out in an orderly manner and covered with a sterile towel until used.

The following instruments are essential for this work:

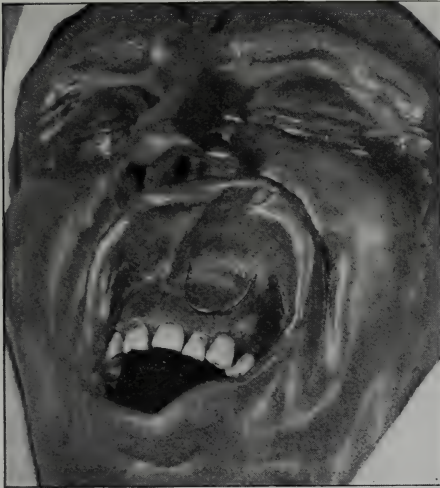
- Round-edged scalpel;
- Curved scissors;
- Hemostats;
- Retractors;
- Straight-edged and grooved chisels;
- Mallet;
- Curets (fine, medium, and large);
- Suture needles (threaded with suture silk);
- Needle-holder;
- Tissue forceps;
- Round surgical burs (small and large);
- Irrigating syringe;
- Flat burnisher, ball burnisher;
- Alcohol lamp.
- Engine handpiece covered with a sterile muslin sleeve.

ANESTHESIA.

All amputations can be accomplished with the improved method of local anesthesia. Assuming we are to amputate the root of an upper lateral incisor: After thoroughly sterilizing the mucous membrane with tincture of iodine, the injection is made intra-orally, inserting the needle in the lip tissue near the fold of the mucous membrane, but at a point a little above and distal to the apex of the canine, continuing upward to about 1 cm. below the middle of the infra-orbital ridge, where the solution is slowly deposited. It is then massaged into the infra-orbital foramen. Anesthesia should be complete in about ten minutes. There should be no evidence of pain upon pressure over the mucous membrane. The patient's face is sponged with a solution of alcohol and water equal parts. The head is wrapped with towels; one towel is brought down covering the face as far as the middle of the nose, another is brought up under the chin, and the two are fastened with safety-pins; the top towel is fastened at the back of the head, forming a sort

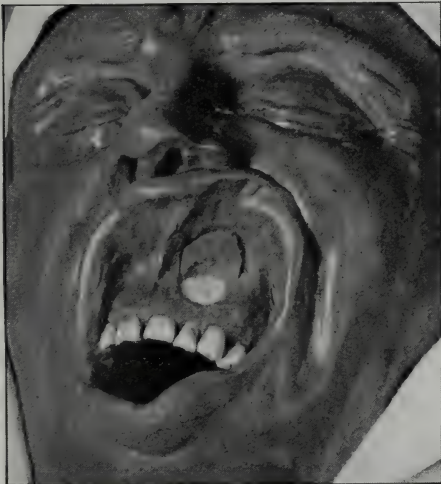
of cap; a pad of gauze is placed in the mouth, the patient is requested to close,

FIG. 1.



Semilunar incision, starting at a point a little above the apex of the central, then downward to a little below the apex of the lateral, and upward to a little above the apex of the canine.

FIG. 2.



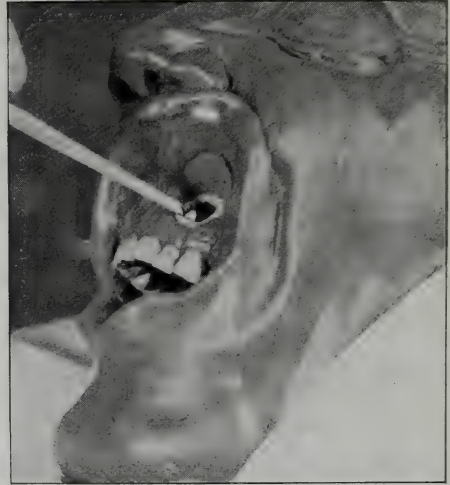
Flap retracted upward, exposing the outer plate over the lateral.

keeping the mouth shut during the operation. Now we swab the field of operation with tincture of iodine.

SURGICAL TECHNIQUE.

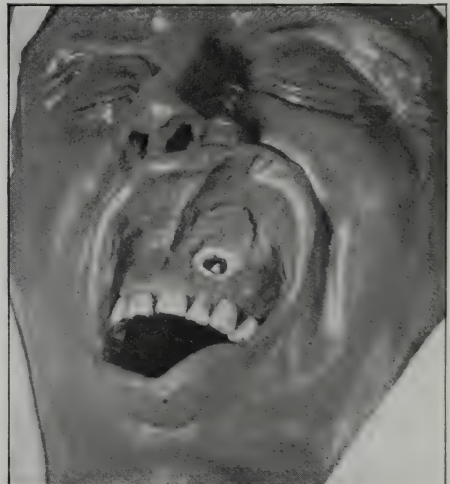
With the scalpel a semilunar incision is made, starting at a point a little above

FIG. 3.



Position of the chisel, with bevel toward the apex.

FIG. 4.

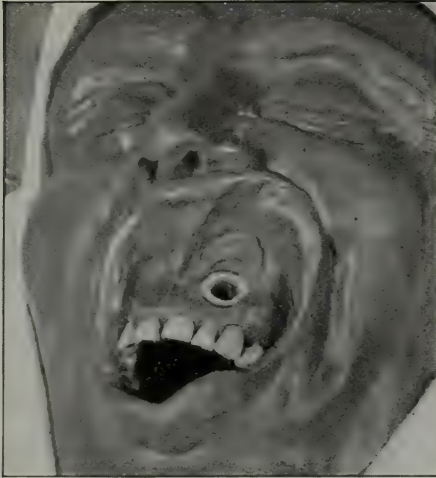


Outer plate cut away, exposing the rarefied area and the apex of the lateral.

the apex of one adjacent tooth, then downward, curving below the apex of the affected tooth; then upward again to

a point a little above the apex of the other adjacent tooth. (See Fig. 1.)

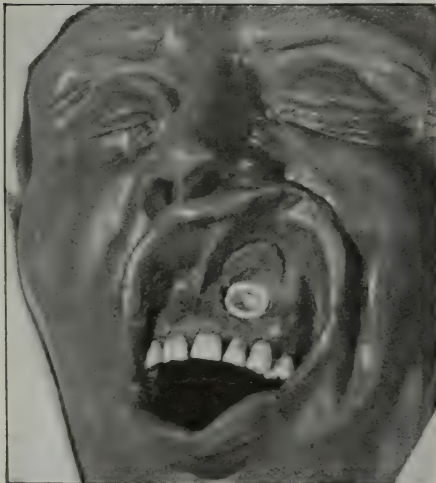
FIG. 5.



The area after the apex has been amputated.

The periosteum and gum are raised from the bone with a periosteal elevator and

FIG. 6.

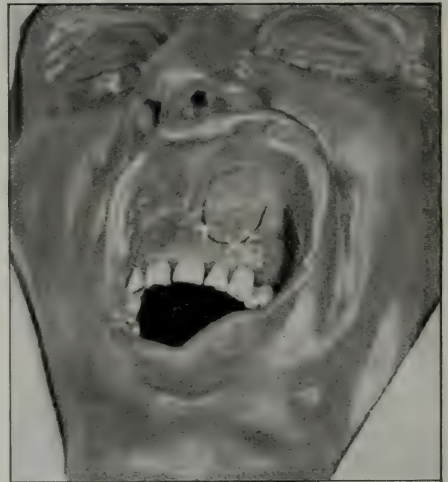


Socket after curetment.

held up with the retractor. (See Fig. 2.) This is known as retraction of the flap. The bone is now exposed to view.

The bleeding is stopped by pressure with a gauze sponge; this should be the work of the assistant. In cases where a fistula presents, a small curet is introduced with a gouging motion and the opening enlarged; then a larger curet is used until enough bone is taken away to expose the affected area. Where there is no fistula we first proceed with a small grooved chisel, making an opening at a point directly over the apex; this opening is enlarged with a broader grooved chisel until enough bone is cut away, exposing

FIG. 7.



Flap held in position with three sutures.

the area and the apex. (See Figs. 3 and 4.) We then cut downward exposing the apex until we reach healthy bone.

The apex may be severed in three ways:

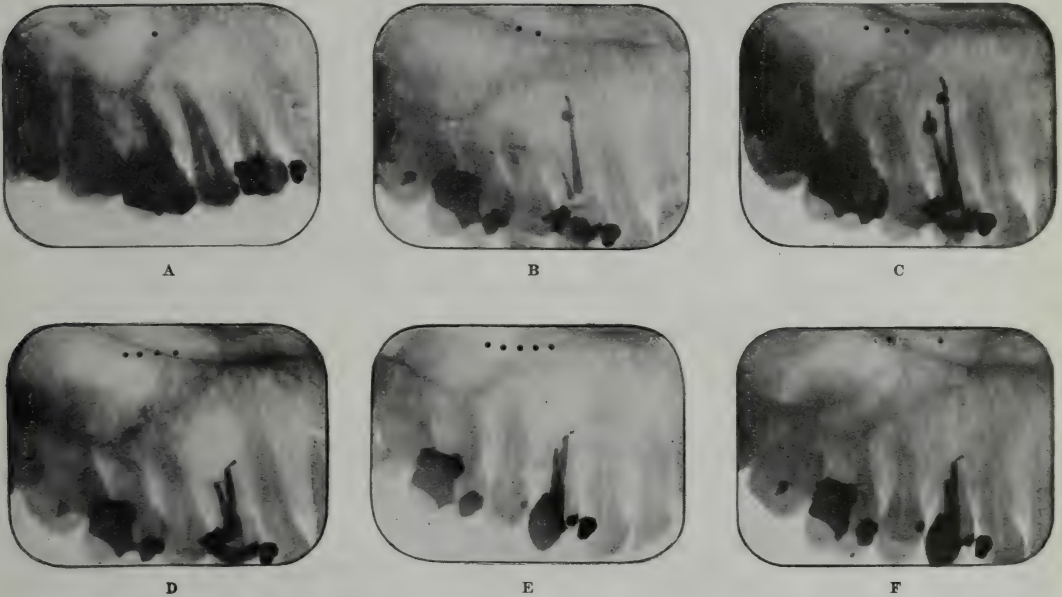
- (1) By transversely cutting the root with a fissure bur.
- (2) With a sharp straight-edged bevel chisel with the bevel toward the apex.
- (3) By trimming down with a large round surgical bur.

The whole cavity is thoroughly curetted until healthy bone is reached, thereby removing every vestige of membrane.

Care must be taken not to injure the periodontal membrane of the adjoining

Further illustrative material, with descriptions. (Figs. 8-13.)**FIG. 8.**

- A. Initial stage of chronic pericementitis, showing thickened membrane at apex.
 B. About two years after, showing progress of rarefaction and granuloma formation.

FIG. 9.

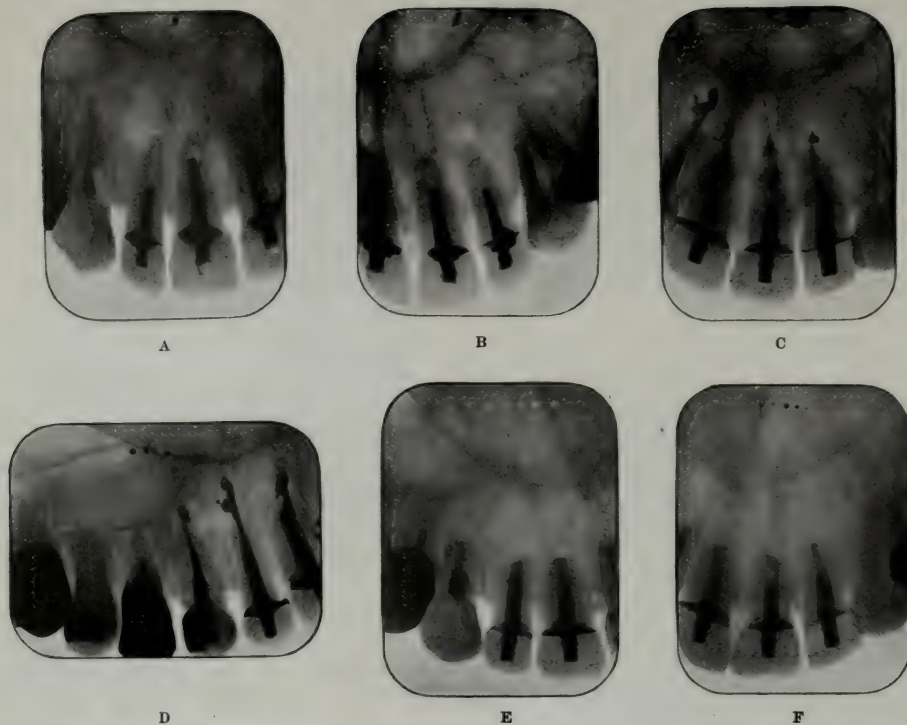
- A. Area of rarefaction above the first bicuspid.
 B. One root properly filled and one insufficiently.
 C. Roots filled, the gutta-percha well condensed.
 D. Radiograph taken directly after amputation and curetment.
 E. Radiograph taken five months after operation, showing regeneration of bone.
 F. Nine months after operation, showing complete regeneration of bone above the apex.

teeth, if exposed; it may cause pericementitis, which might become acute and end up with suppuration and devitalization. The trimming of the exposed part of the root cone-shaped is uncalled for; one clean, round cavity, with the edges

smooth and none of the root projecting into it, is desirable. (Figs. 5 and 6.)

Some operators recommend an application of 10 per cent. silver nitrate on the exposed part of the root, and others the filling of the cavity with bismuth paste.

FIG. 10.



A, B. Rarefied areas above the canine, right and left centrals, and laterals.
 C, D. Canals filled.
 E, F. Five apices amputated at one operation.

FIG. 11.

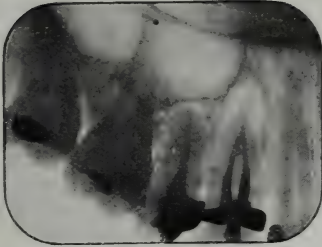


A. Cyst—region of lower right canine and lateral.
 B. Canals filled.
 C. Amputation of apices, and cyst membrane removed.
 D. The socket in process of regeneration, six months later.

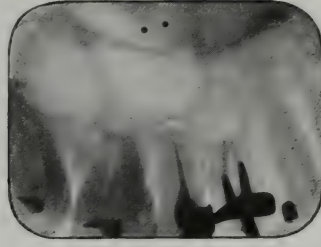
I find all that is necessary to be a thorough irrigation with warm normal saline solution to wash out any débris, then

drying with gauze. The exposed gutta-percha in the canal is now smoothed with a hot ball or flat burnisher; then the

FIG. 12.



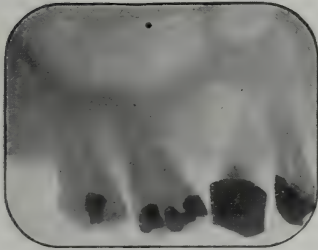
A



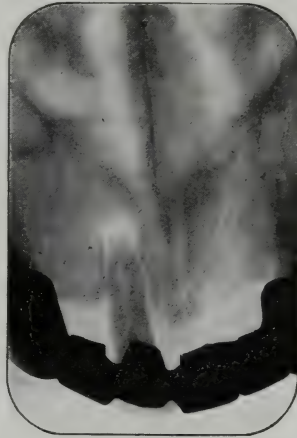
B

- A. Alveolar rarefaction over crowned upper first bicuspid.
 B. Eight months after amputation; regeneration nearly complete.

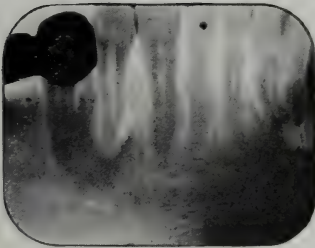
FIG. 13.



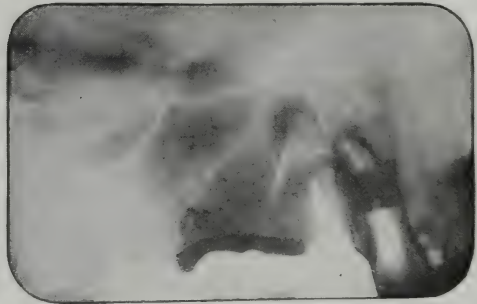
A



B



C



D

Unfavorable Cases.

- A. Entire root almost involved in rarefied area.
 B. Tooth standing alone, with rarefaction above the apex, and alveolar absorption from the cervical margin to about half-way up the root.
 C. Alveolar rarefaction extending from the apex to a point near the cervical margin.
 D. Showing an attempt at root amputation—apices remaining.

whole cavity is swabbed with the tincture of iodine. Now, with a pair of tissue forceps, the flap is brought down so that the edges of the wound approximate;

with a curved needle the suture silk is carried through the lips of the incision. The first suture should be made at the apex or the middle, so that the edges will meet in proper position; then the side sutures follow. (See Fig. 7.)

Assuming our operation has been successful, as far as asepsis and technique are concerned, what takes place?

First, we have a hemorrhage, which is soon controlled by the clot formation between the lips of the incision, as in any healing by first intention. The vessels undergo the changes characteristic of simple inflammation, and large numbers of leucocytes infiltrate the damaged tissue and invade the blood-clot.

The incision outside of the periosteum, that is, in the mucous membrane, is repaired by granulation tissue and regeneration. The blood-clot and other exudates which fill the cavity are gradually absorbed or disposed of by the phagocytes. Meanwhile there is a proliferation of the connective tissue cells of the area, forming and filling the cavity with granulation tissue.

In about six days the innermost or osteoblastic layer of the periosteum has produced a large amount of tissue consisting of broad spindle-shaped cells, plentifully supplied with bloodvessels, derived from the proliferating endothelium of those in the neighborhood. This tissue gradually forms an interlacing in the granulating tissue mass; it resembles bone in general appearance, but contains no lime salts. This is known as osteoid tissue, which gradually ossifies, forming bone.

SUMMARY.

To sum up, we cite the article by Dr. Arthur W. Smith of Rochester, New York (see DENTAL COSMOS, October 1918), who sent a circular letter with questions to fifty-two general practitioners and oral surgeons throughout the country. Eighteen complete and ten partial replies were received, to the following questions:

(1) Do you consider root amputation advisable in any case?

(2) (a) In what case or condition?

(b) On what teeth (anatomically)?

(3) (a) What do you consider the best filling to use in a root-canal previous to amputation?

(b) Why?

(4) (a) In what percentage of your cases have you had a normal regeneration of the bone following the operation?

(b) In what percentage has the apical area failed to recover?

(c) To what do you attribute these failures?

(5) Do you advocate the use of the chisel, the bur, or the chisel and the bur for removing the root apex?

(6) If you radiograph the tooth at intervals after the operation, what have you found to be the average time (in months) in which bone regeneration has taken place?

(7) (a) Do you consider it advisable to suture the incision after operation?

(b) If so, what are the advantages?

(c) If not, what have you found are the objections?

(8) (a) Should the operation be performed by the general practitioner or by a specialist?

(b) Why?

The following were the general conclusions from the answers received to the above questions:

The majority of dentists consider apicoectomy advisable in cases of chronic apical infections where the bone, peridental membrane, and not more than the apical third of the root are involved.

The six upper anterior teeth roots are amputated most easily, the lower anterior ten and upper bicuspids less easily, and the molars with difficulty.

Gutta-percha is recognized as the best material for filling the root-canals. The use of chloroform and resin, chloro-percha, or eucapercha in conjunction with the gutta-percha, seems to be a matter of choice with each individual.

Where the operation has been followed by check radiograms the operators report a moderately high percentage of successes.

Failures are reported as due to faulty technique, low vitality of surrounding tissue, and reinfection.

For removing the apex of the tooth, the bur is given preference over the chisel.

Six months is the average time given for

the complete regeneration of bone in successful cases. The time varies with the age and vitality of the patient.

Suturing of the incision is recognized as the preferable method of closing the wound, as it tends to hasten the healing, prevent reinfection, and lessen the after-pain. In cases of extensive involvement, packing is advocated.

Opinion is well divided as to whether apicoectomy should be performed by the specialist or the general practitioner. It is generally conceded, however, that unless the general practitioner is well equipped, has a thorough knowledge of asepsis, and has developed a

skilful technique, the operation should be performed by the specialist.

BIBLIOGRAPHY.

IVY. *Journal of the National Dental Association*, June 1917.

THOMA. "Oral Abscesses."

BLUM. "Conductive Anesthesia and Oral Surgery."

DELAFIELD and PRUDDEN. "Pathological Anatomy and Histology."

SMITH. *DENTAL COSMOS*, October 1918.

128 WEST 118TH ST.

CORRESPONDENCE

A Notable Concession to Dentistry in Japan.

[THE following communication reports an important advance step in the status of the dental practitioner in Japan. No other nation so far as we are aware has conferred upon practitioners of dentistry the right to issue a death certificate even in cases where the death of the patient is due to a dental disorder. The action taken by the Japanese authorities in this instance is perfectly logical and furnishes a precedent which should be followed in analogous cases by the health authorities of all civilized nations.—ED.]

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—I beg to inform you that in our country it has been decided to create a dental military service upon the same basis as that which exists in the United States, following the representations which I had made to our Government and Parliament.

Regarding the interpretation of our law governing the practice of medicine, particularly as it relates to the question of the right of dentists to issue a death certificate, I am glad to be able to state that we have at last obtained from the authorities the anticipated result; that

is to say, in any case where the patient dies from some disease which has as its direct or indirect cause an oral or dental disease under treatment by the dentist up to the time of the patient's decease, the attending dentist himself is permitted to issue the death certificate, as is ordinarily done by the physician in analogous cases.

I understand that members of the dental profession in your country are not yet permitted to issue the death certificate in cases such as those above cited. If this be true, I hope they will demand this right, and that their effort will meet with success, as ours has done. As we in Japan regard American dentistry as the leader of the world, I trust that they will continue to enlarge the privileges and sphere of action of the dental practitioner, thus continuing to make dental science advance increasingly.

With my best wishes,

Very truly yours,

DR. ITCHIGORA NAKAHARA, Sc.D.,

Pres. Nippon Dental College.

TOKYO, JAPAN.

“Checking of Gum Blocks.”

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Referring to the communication from H. B. Schwartz, in the May issue of the COSMOS, it is not stated which gum sections it is that crack. The accident seldom occurs with bicuspids or molar sections, but is more apt to be met with in sections containing the incisor and cuspid teeth. This is because these sections are curved in outline and are somewhat longer laterally than the others mentioned. If the crack is clean, with no rubber injected into it, it takes place from the contraction of the vulcanite in cooling after vulcanization has been completed. If the crack is dark from the presence of a thin lamina of vulcanite, it is the consequence of over-pressure upon the rubber in packing the case and closing the flask.

There is no sure way of preventing the cracking of the section by cooling of the

vulcanite. It is more apt to occur with dark vulcanite—the rubber used having but little foreign matter in its composition—as such rubber will contract more than that which contains a larger quantity of pigment and “filler.” It is also suggested that the denture be allowed to remain in the flask without opening the latter until it is thoroughly cold.

Vertical checks in the front sections of full upper dentures will sometimes occur if the denture is placed in very cold water, or is allowed to remain in a very cold room in winter, as the contraction of the vulcanite is greater the lower the temperature.

Porcelain has a very small rate of contraction by cooling. That of vulcanite is very great. Porcelain is very brittle.

Yours truly,

GEO. B. SNOW.

LONG BEACH, CALIF.

Dental Care in Pregnancy.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—I have experienced considerable difficulty in the past four or five years in securing the co-operation of the dental profession in caring for the teeth of pregnant women. They seem to be working under the misapprehension that the teeth of these women should not receive the same care as those in other individuals.

It is a common belief that filling or extracting teeth during pregnancy brings on many serious complications, such as miscarriage, deformities in the child, convulsions, etc.

On questioning my dental friends, also patients, I have failed to secure authentic information of a case in which extraction of abscessed teeth, for instance, has done anything but benefit the patient. I am very anxious to secure reliable data on this question. I do not care for hearsay evidence.

I would appreciate very much if you would assist me by publishing this letter, and request that reports be sent to me at 122 S. Michigan ave.

Yours very truly,

E. L. CORNELL, M.D.

122 S. MICHIGAN AVE., CHICAGO, ILL.

Failure in Apicoectomy.

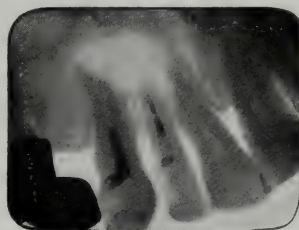
TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—I have read with pleasure the article on root resection contributed to the May DENTAL COSMOS by Capt. Harold J. Parker, and wish to "second the motion," parliamentarily speaking, that the field of root resection be broadened. There is no doubt that the chief factor contributing to the failure of an operation of apicoectomy is the unhappy choice of case, with poor technique a close second.

I am presenting herewith a radiograph of a tooth which, according to the history given by my patient, was resected once by his dentist, and then resected a second time because the dentist discovered that he had not removed sufficient of the apex of the lateral incisor.

I am trying to be charitable to the unknown dentist, whoever he be, but he would probably be one of the first to rise in a dental society meeting to de-

nounce root resection. And from his experience he would be right—would he not? It needs no explanation for the reader to see that even after two resections there has not been the least portion of the apex removed from the



lateral incisor—to say nothing of the necrotic area subapically extending to and involving the cuspid.

Respectfully,

M. HILLEL FELDMAN, D.D.S.

616 MADISON AVE., N. Y. CITY.

"Dental Broach in the Bronchus."

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Anent the paper of Drs. Jackson and Spencer in the March issue of the DENTAL COSMOS, and also the letters of Mitchell and Graham in the May issue:

I do not want to take credit for suggesting a new use for an old material, but may the rubber dam be mentioned as an excellent and foolproof contrivance for

the prevention of such an accident? To those whose inventive genius runs along the line of "extension handles" it may be stimulating to ponder the possibility of the dam serving other functions in connection with the operation wherein the broach is used.

Very truly yours,

R. W. LEIGH.

SALT LAKE CITY, UTAH.

PROCEEDINGS OF SOCIETIES

Pennsylvania Association of Dental Surgeons.

Meeting held at Hotel Stenton, Philadelphia, Pa., Tuesday, April 8, 1919

THE meeting was called to order at 8.30 P.M. The president, Dr. H. B. Mat-teossian, introduced the speaker of the evening, Dr. ALFRED STENGEL, Philadelphia, Pa., who gave a lecture entitled "Relation of Dental Affections to Systemic Diseases."

[This paper is printed in full at page 619 of the present issue of the DENTAL COSMOS.]

DISCUSSION.

Dr. R. E. Denney. I consider it a privilege to have listened to Dr. Stengel's presentation of this subject, for it is the sanest and most interesting that I have ever heard. One would think that he had a dental degree to be so liberal in his opinion. I am very glad, Mr. Chairman, to be asked to discuss this subject, because I feel that it is easily the most important one before the dental profession today; and judging by what appears to be the opinion of many members of the medical profession, it is the most important that has been before that profession in many years, for nearly all the ills that flesh is heir to have been laid at the door of abscessed teeth by one physician or another. We have those enthusiastic men in both professions who take up each new thought without weighing it carefully, and put it into practice. The first word with them is almost the last to be said on the subject. The result is that we have hobbies which we ride like mad, only to come down to a sane pace after a while. These enthu-

siasts, in a short time, are apt to drop the idea altogether when they find that all they believed to be true is not true. But saner men find in all these hobbies much that is good, so our profession advances a little with each wave of enthusiasm. We are all honestly seeking for the truth, and I think we should always endeavor to get at the real truth, and frankly present the subject as it appears to us. Whether my experience agrees with yours or not, I feel it my duty to express my opinions and give my experiences; and it is your duty, if your experiences are the opposite, to tell them as frankly. Now, what has been my observation in this matter?

The other day I went over two hundred X-ray films I had taken during the year, and of these there were only seventeen films of cases in which there had been any complaint of general systemic involvement. None of the other patients had complained of any ailment whatsoever other than local, and many had no local manifestation of trouble. Of those seventeen, there were only two in which I should feel safe in saying that the ailment complained of was caused by the teeth. Seven showed some improvement in general health, the others no improvement whatever. Let me briefly go over some of these cases.

There was one case of indigestion and general toxemia which the physician definitely blamed on an abscessed tooth. The tooth was extracted and new artificial teeth made, but with no appar-

ent improvement in the condition complained of.

In a case of iritis, the day before we extracted the accused abscessed teeth, the iritis cleared up, and two weeks after the extraction it recurred. So the accused teeth were not to blame. In a case of neuritis, the X-ray showed abscesses over the central and lateral incisors. I amputated the roots and sent the root-ends with the abscess sacs to the physician. He made an autogenous vaccine and injected this into the arm of the patient. After a month he was still carrying his arm in a sling, apparently no better.

Another case was one of high blood pressure. An abscessed tooth was found and extracted. The patient died two months later from the high blood pressure. The suspected tooth apparently was not to blame.

The next was a case of general breakdown. The teeth were suspected. The patient had his remaining teeth extracted, but died in about two weeks.

Another case was one of acne eruption of the nose. I radiographed the teeth and found one abscessed central. The tooth was extracted, but after a year there was no improvement in the patient's condition.

I recall two cases illustrating something that Dr. Stengel has said, namely, that extensive abscessed areas do not at times appear to cause any systemic disturbance. In one, the patient complained of tenderness over the upper left second bicuspid. I drilled into the tooth, found it vital, radiographed it, and found a cyst that extended from the second bicuspid to the central incisor. I operated. It was impossible to save the teeth. All the bone was absorbed over them, and nourishment was cut off. I did not have the contents examined, but I believe the contents to have been pus. There was no systemic disturbance whatever. The patient was in good health, and had had no pain.

The other was a case of marked abscess. There was no evidence of the abscess, but the patient had been in the hands of a dentist who was in the

habit of filling roots with cotton. I radiographed the teeth, and the film showed no abscess; but when I took out the cotton dressing, the pus poured out, and I could not stop it. I finally sealed it up with a formaldehyd dressing. After a few days I opened it again; it was the same story. The apex of the root was at the floor of the antrum, and I presume that the pus had lifted up the lining of the antrum and accumulated there. The patient was in perfect health, so far as she or I could tell.

There are a few cases that support this theory of general infection from tooth trouble. I have had a number of cases of pyorrhea in which the health has markedly improved after extracting affected teeth. There were two interesting cases of goiter that recently came under my observation. The physician said positively that the teeth were the cause of the trouble, and we extracted two that were abscessed. The patient was in to see me today. She says she is one hundred per cent. better. The pulse rate was 160 before the extraction. Today it was 120, but it often goes down to 80. The other patient feels well enough to go down South to her home.

There were several cases of toxemia that improved on the removal of abscessed teeth. There was one case of obscure pain in the angle of the jaw. I found one abscess on that side and tried to treat it. The husband, a physician, wanted the tooth taken out. I tried to cure it, but the pain did not improve; and I finally extracted the tooth. Pain ceased immediately. The most marked case that has come under my observation, however, was a case that appeared to be one of great toxemia, which was referred by a physician who did not know just what the cause was. I found four abscessed teeth. One was removed, the others treated, and the patient gained twenty-five pounds in six weeks. She did not change her diet, and took no medicine. The only change in her manner of living was that she was not employed.

So you see that out of these possible two hundred cases there were about one

hundred and eighty abscess conditions in which there was no evident systemic involvement. The patients may have been infected, but there was no visible evidence of it. So I think that while there are instances in which the patients are infected systemically through abscessed teeth, there are more in which they are not. The dental profession is certainly on trial before the world today. Lay and medical writers are taking a fling at us in their journals. It is common for them to advise patients not to have crowns or bridges, because they will result in abscessed teeth, apparently unaware of the fact that a tooth is just as likely to abscess under a filling as under a crown. It depends entirely on whether the root-canals are properly treated and filled. Radicals think every tooth that is not vital should be extracted. I am not of that opinion. It would mean that we should go back at least a generation in our practice; every aching tooth would have to be extracted. I cannot accept that, and will not until there is more convincing evidence than has thus far been presented.

Now just a word about the attitude of the medical profession toward this subject. The average medical man is a broad-minded, clear-thinking man. If he refers a case to you he says: "Dr. Jones, here is a case I am in doubt about. I suspect the teeth as a cause. Will you give me your opinion, and refer the patient back to me." But, unfortunately, we have the other type of medical man who brings a case in which he says that the systemic condition is due to the patient's teeth, and states that he wants them extracted. He does not ask your opinion. A short time ago I had a case like that. The patient only had four incisors, the rest of the teeth having been removed. These were all vital teeth, well decorated with stain and tartar, but were otherwise all right. I told the doctor they were not the cause of her systemic condition, but he had gone so far in his diagnosis as to tell the patient that they were, and felt he could not recede from that position. We are not as good friends as we were. A medical

man has no right to get himself into such a position. We should work together.

The medical X-ray man is another man who oversteps the bounds. He not only diagnoses, but writes out his diagnosis and in some cases the treatment. I met with an instance a short time ago in which the man said the lower canine on the right side was abscessed, and should be extracted. It was, however, perfectly vital. There was not even a filling. The first-bicuspid was abscessed, however. The man who does not even know the name of the teeth certainly should not diagnose tooth troubles. Suppose the patient had gone to an uninterested dentist, without the films but with the written diagnosis only; this patient might have lost a good tooth.

There was another case that was laughable. The whole mouth had been radiographed, and there was not a single root-end that showed in the films. All were too short because of the incorrect placing of the films. He said that as far as he could see there were no abscesses except on one central incisor, which he thought should be extracted. *So far as he could see* was good, for not even the root-end of the central incisor showed on the film! I think such cases are unwarranted assumptions of professional duties. Dental men spend three or four years in a college, and all the rest of their career in acquiring the necessary knowledge to diagnose dental conditions, and the least that the X-ray man could do is to permit us to diagnose these conditions and prescribe treatment.

One or two truths stand out prominently and clearly among the contradictory opinions on this subject. Abscessed teeth are disease conditions, and certainly should be eradicated. The root amputation referred to by Dr. Stengel has proved in my experience, in the majority of cases, an entirely satisfactory means of removing abscesses from single-rooted teeth. Medical treatment has proved satisfactory in many cases. But those in which the X-ray shows they do not respond to treatment should unhesitatingly be extracted. There is one other

truth that is of transcendent importance, and it is the duty of every lay and dental writer and teacher to spread this truth broadcast—that a vital tooth will not abscess. If we preserve the pulps of teeth we will not even have to consider this problem of systemic infection from abscessed teeth. So it is perfectly evident that the way to solve this problem for the future is to prevent the cause from ever arising. Hence the importance of the patient's seeing the dentist at frequent intervals, so that all small cavities may be filled at their inception, never permitting them to reach the aching stage where the pulps are involved and destruction of the pulp is necessary. This is the great lesson the public must learn, and we must all help to teach it.

Dr. G. W. Dorrance. Just what is meant by focal infection? Every physician and dentist appears to have a different definition. Is any infection which causes general systemic disturbances to be considered a focal infection? If this is true, then it is not fair to limit it to apical abscesses.

I feel that if the term is used at all, it should be limited to a chronic walled-off abscess or infection. The term is a bad one; it is too vague. The so-called focal infection when found should be given its proper name. If it is at the apex of a tooth, it is an apical abscess.

In the maxillo-facial clinic at the University of Pennsylvania we are not using the term focal infection. It offers too much leeway to a student; the exact diagnosis is required.

We see in our clinic many apical abscesses which apparently do not produce constitutional disturbances. Likewise we see many cases where constitutional disturbances are present and remain after the abscesses of the teeth have been cured. Some very gratifying results have been obtained when the mouth was properly treated; the point I wish to emphasize is that, given a patient with diseased teeth and general constitutional disturbance, it does not follow that the teeth in every case are the cause of the disease. On the Continent the British soldiers' teeth in the vast majority of

cases were in frightful condition, yet most of these men were physically fit.

For a localized infection to produce systemic symptoms there must be some obstruction to drainage, *i.e.* no drainage, or at best very slight. The toxins must be absorbed by the blood stream. As a rule, the lymphatics in these cases are not involved.

There is another point I wish to bring out in connection with neuralgia. If neuralgia is due to an infection, it should clear up after the removal of the infection, but be certain you have removed all the sources. The finding of one abscess does not preclude the presence of others. When an X-ray is ordered for these cases, have it complete—every tooth and sinus, not simply the one suspected.

Dr. Stengel brought up the question of pernicious anemia. We made a study of these cases with special reference to the teeth and mouth, and while we often found gingivitis and poor condition of the mouth, we could not attribute the disease to this.

Dr. W. A. Jaquette. I was much interested in Dr. Stengel's warning, especially as coming from the medical profession. It made me think that it is not a question for warning the dental profession, but for emphasizing the responsibility. There is so much said regarding the condition of the teeth being related to the general health that I have not thought so much on the other side. Dr. Stengel spoke about being opposed to the removal of normal organs, and I may say that the dental profession is a unit in that. I have found all the speakers talking of constitutional disturbances due to dental infection. The cases cited this evening prove there are disturbances due to dental disease, but I think that leaves out the large majority of cases. The dental condition should be considered as an associated factor more often than the single cause.

Each speaker mentioned the diseases due to the teeth, and inferred that the removal of the teeth removes the disease. This, however, often is not the result, except in so far as the removal of one

of the contributing causes lessens the burden carried by the diseased individual. Dr. Stengel speaks of tooth-root infection to be looked for after forty years, but not in the young. He also spoke of anemia in childhood due to the tonsils, and I should like to know why it should not be looked for also from a tooth infection. Pulp exposure may occur in a very young child, even before ten years of age. Dr. Stengel, in calling us to account and placing the responsibility on us, says we must learn to diagnose the difference between an abscess which is, and one which is not infecting. I wish we might; so that the abscess that is not infecting could be treated and the tooth saved, while the tooth that is infecting the system could be removed. I think we might well look at the anatomical relation, and see that an abscess of long standing destroys the peridental membrane, and there is necrotic tissue. If that is present in the bone, there may be a sequestrum formed and that part of the bone lost. We must assume our responsibility, and say that much of focal infection is due to our treatment. A neglected tooth may have a chance to drain, but a crown prevents the possibility of drainage.

Dr. J. Clarence Salvas. It has been a great pleasure to listen to this illuminating lecture by so distinguished a representative of the medical profession as Dr. Stengel. It is gratifying to note his conservative spirit, especially in these times when the tendency is so markedly radical among both the medical and dental professions. Recently a physician in the course of a paper stated that "death lurks in the cavities of the head, the tooth sockets, the nasal cavities, and the middle ear and tonsils." Moreover, he advocated the removal of every devitalized tooth without any attempt to save them. This is rather shocking according to our old standards, when the supreme object was to conserve teeth. Why? To avoid the artificial denture. In the light of modern investigation, our efforts in this direction have been futile; we have been trying to cure con-

ditions that we have in a large measure created. There is no disputing the fact that teeth with putrescent canals, or canals that have become the seat of mixed infection should be removed, as their retention will sooner or later become a menace to the health. All pulpless teeth, however, are not putrescent, and with our improved root-canal technique they can be kept healthy.

Dr. Stengel mentioned that children are not susceptible to focal infection. No doubt they are less susceptible than adults, but now and again we meet with conditions that are unmistakably the result of diseased teeth. I had an interesting case two years ago. A boy nine years of age developed cardiac trouble. On the advice of the physician he was taken out of school and kept under treatment for two months, with no appreciable improvement. A specialist was consulted who suggested the condition of the mouth as a contributory cause. He was then sent to me, and I found the upper molars abscessed, the gums swollen, and pus running in large quantities. The teeth were extracted, and within six weeks his condition was sufficiently improved for him to return to school.

Another case, that of a girl of eleven. The child was unable to keep up with the other children of her class. She became irritable, and at times would have spells of crying. She was then taken to a neurologist, who called me in to consult regarding the condition of the teeth. An oculist was also consulted, as the child complained of a twitching and a drawing down of the right eye. I found the upper right first molar entirely broken down, the canals were badly putrescent, the surrounding tissues swollen, and pus oozing from the socket. The lower right was in a similar condition. I had the teeth removed, and the rapidity of complete recovery was remarkable.

We are fortunate in having Dr. Stengel with us this evening. He has contributed much of great value from the medical point of view which helps us to better understand the gravity of the situ-

ation we are called upon to meet. I move that a vote of thanks be extended to him.

The motion was seconded and carried.

Dr. Stengel (closing the discussion). In answer to the question as to why I feel that in youth root abscesses are not to be looked for particularly as the cause of systemic infection or secondary conditions, as compared with the frequency of such causes in later years, I would say there are several reasons, one of which the speaker himself cited when he said that while root abscesses may, of course, occur in youth, they do not do so nearly so often as in adult life. Another reason is that other infections are more common and severe in childhood. Tonsillar infections and throat infections are more liable to occur and to be serious then than later in life. A third reason, I suspect, is that in youth root abscesses are liable to bring about their own drainage more readily than in later life, and the absorption of infection is a little less likely to occur.

I find, also, from the remarks of one speaker, that I did not make myself clear about making sure that a root abscess is responsible for symptoms. What I meant was this: If you have any serious condition, particularly if you have a localized infection about a root. I do not think you should hesitate very much about sacrificing a tooth; but if I felt reasonably certain that a localized infection about the root of the tooth was not responsible for the condition present, I should be more willing to urge my patient to temporize and use other treatment, which might take a longer time and which he might like to avoid, than if I thought a serious menace was present. If I really felt that a bad endocarditis was there, I should not want to tempo-

rize—in such circumstances one should extract the tooth; but it is next to impossible to say that a certain root abscess is the cause of a certain general condition. You must study a case to determine when these things must be treated, just as you do local infections anywhere. You should not sacrifice the teeth unless you have good grounds for doing so.

I intended to say something on another topic. There is afoot a new cult that is finding all kinds of queer things due to impacted teeth. A good deal might be said on this subject. I have no brief for or against those who are in that school, but there is a good deal of nonsense being written about serious general diseases being occasioned by impaction. I am in the way of seeing frequent cases in which very serious diagnoses have been made based on suspected impaction of unerupted third molars. Sometimes there is truth in it, but very much more often there is none as compared with the question we have been considering tonight. I was recently consulted by a physician with a patient who had a definite form of insanity, and had been given assurance by an eminent authority that the condition of her teeth was the cause of her mental condition. The X-ray showed abscesses at the roots of two or three teeth, but the doctor and myself did not hesitate to advise strongly against doing anything; because we did not believe that her insanity was due to this; and on account of her mental condition, we thought the removal of the teeth would have done more harm than to let them alone. There is a good deal of underground conversation going on about the terrible things that are caused by unerupted teeth, and most of it is nonsense.

The society then adjourned.

"Forsyth Day" at the Forsyth Dental Infirmary.

Reported by CHAS. T. WARNER, D.M.D., Boston, Mass.

IN order that the profession at large might have an opportunity to become better acquainted with the institution and its work, the trustees of the Forsyth Dental Infirmary appointed May 6th as "Forsyth Day." Invitations were sent to all members of the Massachusetts Dental Society, as well as to many members of the profession in other states, to visit the Infirmary on that date.

In addition to the daily routine work, a few cases of especial interest were shown in the various departments, and at 4 o'clock Dr. H. Edmund Friesell of the University of Pittsburgh gave an address, in which he emphasized chiefly the great value to the city of having an institution doing the work that this one is, and how a similar work must be established in other cities. He paid homage to the genius, originality, and love of humanity displayed by Mr. Forsyth in the founding and maintenance of this Infirmary, a genius which has few parallels.

One of the most important departments, that of Research, was explained by Dr. Percy Howe, the chief of the department. This is one of the best, if not the best, equipped laboratories of its kind in the country, and Dr. Howe devotes more than half of his time to it. His work on root-canal sterilization is widely known, and he is now, with the aid of his assistants, working on the problems of alveolar infections and also the micro-organisms of caries. Much valuable data has been collected, and information of great importance along these lines is being prepared for release to the profession.

The dental operators and oral hygienists were shown in their routine work, an interesting feature of the dental

operating department being Dr. Hill's method of quick root-canal sterilization by means of 10 per cent. solution of formalin followed by 4 per cent. solution, each application being accompanied by the free use of hot air. In an institution of this kind, where conservation of time is a great factor, as many cases must be treated in the shortest possible space of time, this method has been found most efficient, and together with the silver reduction method has reduced the trouble from root-canals to a minimum.

In the operating amphitheater two short talks were given, one by Dr. John Adams on the orthopedic work being done at the Infirmary, and the other by Dr. Murdock Smith on the "Ductless Glands." Dr. Adams has examined over 600 cases taken at random from the clinic, and in over 50 per cent. has found lateral curvature of the spine. In practically every case there was adenoid and tonsillar trouble, with a constricted arch, confirming the theory advanced by Dr. Bogue—mechanical means for correcting this deformity having so far proved a failure. Dr. Adams is investigating the above causes more exhaustively, and hopes to report soon upon his findings.

Dr. Smith showed a most interesting case of a boy thirteen years of age who had been under his care for the past four years suffering from thyroid deficiency, and who at the time of admission had the mentality of a child of four; surly of disposition and delicate of physique, with the teeth which had erupted badly pitted and poorly formed. A most surprising change has taken place in four years through the administration of thyroid extract; the teeth which have since erupted are of normal form and without pits; in fact, his whole physical appearance has improved,

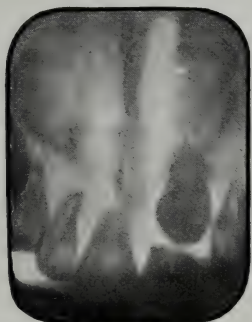
he is doing well in school, and to his mother's delight his disposition has been transformed and he is now pleasant and cheerful.

Dr. Wm. E. Chenery, the head of the Surgical department, explained how all patients admitted to the Infirmary are examined for adenoids and enlarged tonsils, and those requiring treatment are operated upon. The Infirmary is pro-

placing a central. The radiograph showed the malformed cuspid, in erupting, causing physical pressure on the root of the central, and root absorption taking place from this pressure. (Fig. 1.)

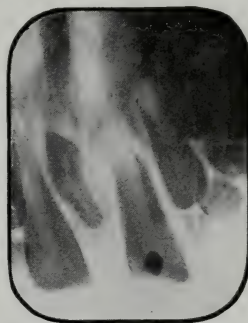
In the Extracting clinic, Dr. Gobie operated on a case of impacted supernumary tooth. The centrals were widely separated, and the radiograph showed a tooth lying between and buccally to

FIG. 1.



Erupting cuspid causing absorption of central root.

FIG. 2.



Supernumary between centrals.

vided with two wards, and nurses are in constant attendance so that patients may be kept for pre- and post-operative treatment.

Owing to the war, the Postgraduate School of Orthodontia has been suspended for the present year. The department exhibited a wealth of material, cases being shown of every class and subclass. Dr. Delabarre, the chief of the department, showed one most remarkable case of a child of twelve, in which a cuspid in erupting was literally dis-

them, a peculiar feature being that its position was inverted, the root pointing downward. (Fig. 2.) Local anesthesia was used, with perfect results. The bone was burred away for a quarter of an inch, exposing the root; the tooth was loosened with elevators and removed, root foremost, with forceps.

The day proved of great interest to the visitors, acquainting them with the work and aims of the institution. It is planned to make "Forsyth day" an annual affair.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDWARD C. KIRK, D.D.S., Sc.D., LL.D., *Editor.*

L. PIERCE ANTHONY, D.D.S., *Associate Editor.*

PUBLISHED BY THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Virgin Islands, Cuba, and Mexico. Canada, \$1.40. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the EDITOR, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, JULY 1919.

EDITORIAL DEPARTMENT

The Bridgeport Demonstration.

THE oral hygiene movement, which has now taken on the proportions of a worldwide activity, has had two distinct periods of growth, each period under the impelling influence for the time being of a dominant idea.

The first period was that in which attention was focused upon means for stemming the tide of destruction wrought by dental caries in the teeth of school children. Statistics had abundantly shown that dental caries was well-nigh universal in children of school age; that caries with its sequelæ was not only a cause of physical defect in itself, but the antecedent in a series of ills that were a menace to the general health and physical efficiency of the individual. These fundamental facts at once suggested attacking

the problem by application of the usual methods of treatment of dental caries, viz, the filling of cavities, extraction of useless broken-down teeth, and removal of deposits, with instructions to the patient in the ordinary home care of the mouth. The point of view in this earlier period was almost wholly that of treatment of the case from the reparative standpoint.

Several years of effort exerted under the influence of this limited conception of the situation gradually brought out the recognition of the fact that an oral hygiene campaign conducted only from the standpoint of the reparative ideal was totally inadequate to cope with the existing conditions. It was realized that the entire man power and resources of the whole dental profession, even if continuously concentrated upon the repair of the damage regularly arising from dental caries, would scarcely make a noticeable impression upon the general progress of the disorder. Moreover, the attempt to eliminate the evils of dental caries by repairing the results of its ravages after the damage had been done was unsound in principle, and therefore defective in policy, in that it did not strike at the roots of the trouble.

Recognition of these facts brought into leading prominence the ideal of prophylaxis—of prevention rather than restoration—as the one and only hopeful means of reducing if not eliminating the evils of dental caries. Immediately the importance of prophylaxis was recognized it was also seen that it involved the intelligent co-operation of those to whom it was to be applied, viz, the lay public, and especially children of school age; and it was this latter consideration that made necessary the development of the educational factor, the so-called oral hygiene propaganda in its several forms and applications.

In 1910, at its meeting in Denver, Colo., Dr. W. G. Ebersole of Cleveland, Ohio, chairman of the National Dental Association Committee on Oral Hygiene, sounded the educational keynote of the oral hygiene campaign as the factor which was the vital element in the propaganda of prophylaxis. He said:

The success of the past year's work is due to the fact that the policy of your committee has been changed from a philanthropic one to an educational or economic one. The leaven which had been distributed during the nine years that your committee had been

working had been chilled and retarded in its action by "philanthropy"—philanthropy abhorred by the self-respecting poor, deplored by the middle class, and despised by the rich. It needed the heat and warmth of education to enable the leaven to work. Education appeals to the rich, the middle class, and the poor alike.

Education, then, is the watchword. It is our battle-cry in the great undertaking before us. Its effect, so far, has been successful, and it promises to be even more so for the future. Briefly told, tomorrow will show every dental organization in the world working in the oral hygiene field from an educational point of view. Our governments—municipal, state, and national—will be as insistent upon healthy mouths in school children as they are upon vaccination.

We present in this issue the report made by Dr. Alfred C. Fones covering five years of oral hygiene work in the public schools of Bridgeport, Conn., in which it is clearly evident that while the reparative treatment of dental lesions constituted an important feature of this demonstrative campaign, the vital factor in the success attained was the emphasis which was placed on the educational work. Like the demonstration undertaken in the Cleveland public schools in 1910, but on a more comprehensive scale, the results furnish incontestable proof of two fundamental facts—first, that oral hygiene is a positive safeguard against disease, and second, that its introduction into the public school system results in an economic advantage to the taxpayer. In short, oral hygiene is justified on the grounds of the public health interest and of public economics. On the broader ground of humanitarianism it is self-evident that any activity which relieves our future citizenship of even a portion of the handicap of ill health, of retarded mentality, of physical inefficiency, and helps to make possible a normal vigorous development, needs no argument for its defense or promotion.

The case for oral hygiene in children of school age has been variously stated, but we commend to the thoughtful consideration of our readers the position as it is phrased by Dr. Fones in his report, constituting as it does his main thesis:

Therefore we must deduce from our analysis of school hygiene that the most conspicuous defect of the child is the unsanitary condition of his mouth. Like the pig-pen or garbage-drain slowly

seeping its poison into the brook which flowing into the reservoir contaminates the water supply to a city, so do the products of abscessed teeth with decomposing food slowly but surely poison the human system. Such mouths breed disease. Such children cough and sneeze millions of germs made virulent and active in an ideal feeding-ground.

The case is not overstated, for the record of the five years' observations which the report sets forth indicates that there is yet to be included in the category of ills immediately traceable to the unsanitary mouth a large group of psychoses, neuroses, disturbances of the special sense organs, and general nervous complications having their initial pathogenesis in dental disorders. The Bridgeport report should receive thoughtful consideration everywhere by school authorities and medical and sanatory officers concerned with child welfare work.

We ask all our readers who realize the importance of this health-saving work to use their personal influence in bringing the subject matter of the Bridgeport experiment to the attention of the public officials referred to in their respective localities.

BIBLIOGRAPHICAL

TUBE TEETH AND PORCELAIN RODS. By JOHN GIRDWOOD, D.D.S. University of Pennsylvania, L.D.S. Edinburgh. With 260 Illustrations. Longmans, Green & Co., Paternoster Row, London; Fourth ave. and 30th st., New York; Bombay, Calcutta, and Madras. 1918.

This work is an issue in book form of the author's contributions on Tube Teeth which appeared serially in the DENTAL COSMOS during 1914 and 1915 (*i.e.* vols. lvi, lvii). The whole subject is now accessible to the reader in consecutive order, with a copious index and introductory chapter helpful to a just appreciation of the scope and applica-

bility of the system so ably advocated and expounded by the author.

The book is a distinctive and valuable contribution to our knowledge of prosthetic technique, as well as a notable addition to dental technical literature. Dr. Girdwood has devoted intensive study throughout his long and active professional career to the possibilities of tube teeth and tube rods in the construction of dental restorations. No one in the dental profession is so fully qualified by training, by study, and by long and varied experience to speak authoritatively on the subject here under consideration.

The book is more than an exposition of tube teeth restorations; it is a monograph upon a department of dental prosthesis in which tube teeth and porcelain rods constitute the basic materials from which by the author's technique harmoniously artistic and hygienic dental restorations are created. The author demonstrates how from his favorite material the exacting ideals of true dental prosthesis may be readily attained.

Moreover, the convincing and practical way in which, step by step, the underlying technique is elaborated not only makes the book a valuable laboratory guide, but gives it an educational value far exceeding the limits of the art to which it relates. No one can sympathetically read this work without catching in some degree the appreciation by the author of the necessity for the embodiment of the ideals of artistic harmony as well as of functional efficiency in prosthetic restorative operations. Dr. Girdwood rejects the "ready made" principle, and pleads rightly for individually harmonious adaptation in prosthesis—a doctrine which is as unassailable in dental art as it is in art generally.

We commend the perusal of the book to all of our readers for the solid practical information which it contains, but more

especially for its implication throughout that "The best is none too good" in dental prosthesis as in everything else.

Books Received.

Books received are acknowledged in this column, and such acknowledgment must be regarded as a sufficient return for the courtesy of the sender. Selections will be made for review in the interests of our readers and as space permits.

"Nakahara's Anatomical Articulator." By ICHIGORO NAKAHARA, Sc.D., Tokyo, Japan, 1918.

"Transactions of the Sixth International Dental Congress—London, August 1914." Compiled and Edited by H. R. F. BROOKS. Published by the Committee of Organization, Hanover Sq., London, W.

"Transactions of the Panama Pacific Dental Congress, held at San Francisco, Calif., U. S. A., August 30 to September 9, 1915." Edited for the Committee of Organization by R. OTTOLENGUI, D.D.S. In three volumes. Vols. I, II, and III.

"War Surgery of the Face." A Treatise on Plastic Restoration After Facial Injury. By JOHN B. ROBERTS, A.M., M.D., F.A.C.S., Professor of Surgery in the University of Pennsylvania Graduate School of Medicine. Lecturer in the Civilian School of Plastic and Oral Surgery established in Philadelphia by the Surgeon-general, U. S. A. Prepared at the suggestion of the Subsection on Plastic and Oral Surgery connected with the office of the Surgeon-general. Illustrated with 256 figures. Price \$4.50. New York: Wm. Wood & Co., 1919.

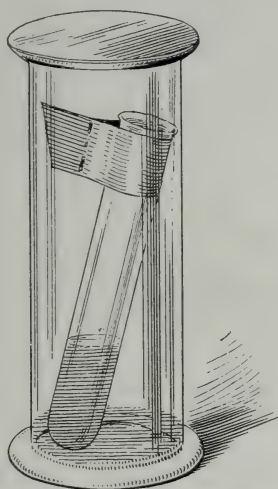
PRACTICAL HINTS

This Department specially welcomes the brief presentation by our readers of any novel suggestions or methods which in their own practice have proved to be time-saving or to possess other features of advantage.

Novocain-Adrenalin Stock Solution.

By J. H. ELPHINSTONE, D.D.S., L.D.S., Aberdeen, Scotland.

I HAVE used the following method for some years for preserving the novocain-adrenalin solution, and find it practicable in the everyday office work. It saves much time and trouble in preparing a



Acid-chloroform cylinder for preserving adrenalin solutions, novocain-adrenalin solutions, etc.

fresh mix for each injection. As far as I am able to judge, the stock solution is quite as good as the freshly made mix.

Make a solution in the ordinary way, but dissolve a whole tube of the novocain-adrenalin tablets in a capacious test tube

so that it can be well boiled. The tube containing the solution is stored in a covered glass cylinder, in the bottom of which is a small quantity of chloroform and a single drop or less of dilute hydrochloric acid; the merest trace of acid suffices. The cover of the glass cylinder should be smeared with vaselin to render it proof against evaporation of the chloroform. Chloroform is a volatile antiseptic and keeps the liquid sterile as well as the test tube and contained air; in this way it is superior to the non-volatile antiseptics.

The infinitesimal trace of HCl in the atmosphere sterilizes the adrenalin in a wonderful way. The color remains good for quite a long time; without the acid it would quickly show discoloration. I am aware that the latter contradicts what is usually taught about local anesthetics, but I have never been able to trace any rational reason for insisting on a fresh solution. It suffices if the solution is sterile and chemically undeteriorated. At any time the solution may be boiled in the test tube before use to make sterility absolutely sure.

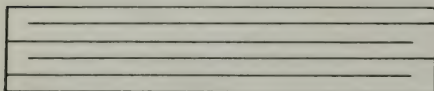
[It should be noted that the vasomotor constrictive action of adrenalin is markedly retarded by boiling for a period of longer than five seconds and is completely destroyed by boiling for thirty seconds.—Ed.]

Soldering Without Pits.

By J. F. HURSTHOUSE, Dental Surg. and Capt., Otago Reg't N.Z.E.F.

PITS are caused by small particles of borax being left in the molten solder. To prevent this occurring, the case should be heated up to the fusing-point of the solder, and the latter, boraxed and hot, fed in, in strips. The solder should

FIG. 1.



be kept molten or remelted if it cools. In this way the borax is kept on the surface.

The solder should be cut in strips; if made or bought in small lots this can be done by cutting it as per diagram and bending it almost straight. (Fig. 1.)

Sufficient should be ready for the case, and in holders made of piano wire, so

that one can go right on once the soldering has started. These holders can be made by bending the wire around a mandrel, say the size of a lead pencil, three or four times, and inserting the solder between them. (Fig. 2.)

FIG. 2.



A bottle of equal parts of boric acid and borax in saturated solutions is useful. The solder can be dipped into this flux and dried before using. When the case is hot enough, the blowpipe flame should be reduced to a fine point and kept on the solder just where or almost before it touches the piece. With practice one can get a case hot and feed in enough solder in a few moments without allowing the case to cool at all.

Contouring Synthetic Fillings.

By ABRAHAM KAPLAN, D.D.S., New York, N. Y.

To very easily establish proper contour and at the same time obviate the excesses attendant upon filling large anterior cavities with synthetic porcelain, the following method is presented:

After proper and complete preparation the cavity is filled with temporary stopping, which is modeled to the exact reproduction necessary in the finished product, including form, margins, contact point, etc. An impression of the

tooth is then taken in modeling compound, held between the fingers and pressed around the site of reproduction. When hardened it is removed and broken at the incisal tip, thus forming two molds. Each side of these molds presenting toward the cavity is coated with cocoa butter. The temporary stopping is then removed and all preparations necessary before filling are carried out. The lingual mold is now returned to its

original lingual position over the tooth. The synthetic porcelain having been mixed is pressed into perfect contact with all parts of the cavity, leaving a slight excess on the labial side. The labial mold is first pressed tightly in to place, and then the lingual mold. The junction of the two molds at the incisal tip should be perfect. When the synthetic porcelain has set suffi-

ciently the molds are removed, leaving in place a filling which requires only finishing.

An added advantage of using this method is found in the fact that no manipulation of the synthetic porcelain is necessary during a period when any kind of stress is detrimental to the strength of the finished product.

762 SECOND AVE.

Abscessed Teeth Can be Restored to Usefulness.

By A. L. ROAT, D.D.S., Philadelphia, Pa.

SOME time ago I discovered that an abscess I treated on the anterior root of a lower second molar showed the affected area somewhat blurred but evidently corrected. The X-ray specialist had the same opinion. The tooth is giving complete satisfaction for the second year and the radiograph still shows the area clear.

Since that time I have treated many teeth marked for the discard by the X-ray. If a tooth shows any evidences of recuperative power I try it out. If there is a fistula or it seems advisable to make one, I proceed in the usual manner of treatment and get excellent results, because the radiograph proves the restored condition.

If the sac is a small one on a single root, I note its position and then open the tooth and root-canal to the apex. The subsequent procedure is as follows: Enlarge the opening and pump out the sac, using a broach wrapped with cotton dipped in campho-phénique. Pump gently, and work so as to draw the contents *out of the sac* by long strokes from the sac to the pulp chamber. Then dry the canal. Dress with cotton and formocresol just damp, not saturated. Seal for two days and again pump out the sac. Fill canals with sterile gutta-percha points and seal for thirty days. Prove with radiograph, and fill the tooth. If not successful try it all over again and you will succeed.

Removing Steele's Facings from an Old Bridge.

By WIRT H. CONKLIN, D.D.S., Rochester, N. Y.

AN easy and convenient method of removing Steele's facings from an old bridge is to boil the bridge in dilute

nitric acid for from ten to fifteen minutes, when the facings can be readily removed.

Removing Mercury Stains from Gold Crowns.

By **SAMUEL CORNFELD, Philadelphia, Pa.**

OFTTIMES the question arises how best to remove the silver stain caused by mercury on a gold crown after it has been cemented into place.

In the mouth I have found that the simplest procedure is to take a small felt wheel which has been well rouged and inserted into a mandrel; this placed

in the handpiece of the engine and revolved at a high rate of speed over the discoloration (an alloy of mercury and gold) will remove it in a few seconds, the rouge adding greatly to the luster of the crown.

Enough heat is evolved in this procedure to drive off the mercury.

Suggestions to Beginners in the Use of Novocain Conduction Anesthesia.

By **A. S. MACMILLAN, D.D.S., Philadelphia.**

THE ability to use conduction anesthesia successfully may be acquired by the general practitioner without going to the expense and inconvenience of taking a special course of study in a dental school or other institution. Certain methods of home study, diligently carried out, will prepare the student to effect the actual injection without subjecting the patient to harmful experimenting. The following suggestions may prove of some value to those not having the opportunity of receiving special instruction:

First: Acquire a thorough knowledge of the anatomy involved by studying the dry skull as well as by book study. Frequent eye-study of the skull impresses the anatomic structures upon the mind much more clearly than by mere book study.

Second: Become familiar with the technique of the injections as given in

standard works on the subject. Prinz, Fischer, and Thoma may be profitably studied.

Third: Practice the injections on the dry skull, striving at the same time to visualize the soft tissues as present in the living subject. Frequent resort to this practice will soon develop facility in locating the various foramina with the needle.

Fourth: When making routine examinations of patients, take the opportunity to palpate the structures involved in the injections, then make imaginary injections.

Fifth: In using novocain, remember that haste should not enter into the procedure. "Make haste slowly" is a good rule to follow.

If these suggestions are carefully carried out, I am sure the average practitioner can approach the actual injections with confidence.

Reclaiming Used Wax.

By C. R. SCHOLL, D.D.S., Reading, Pa.

FOR some time I have had a habit of throwing odd pieces and all waste wax into a vacant drawer in the laboratory bench.

Wanting a quantity of wax for some experimental work, I thought of this collection, which I proceeded to put into a two-quart boiler and place over a slow fire to melt, finally boiling it for about ten minutes to insure separating all the residue, or rather, foreign matter.

Allowing the wax to cool, I then removed it from the boiler, reheated and emptied the residue, replaced the wax

and remelted it. While hot I dipped pieces of clear glass into the molten wax, withdrawing to cool slightly and redipping until I had the desired thickness of deposit on the glass. While warm but firm I ran a sharp knife about the edges of wax on the glass, cutting off that portion, and stripped the wax sheet from the glass.

I was agreeably surprised at the quality, texture, and color of the wax—so much so that I am using it for many wants that arise in the laboratory.

Treatment of Trifacial Neuralgia by Alcoholic Injections.

By PHIL L. SCHWARTZ, D.D.S., New Brunswick, N. J.

THE following interesting case recently came under the observation of the writer. Patient, male, age sixty, edentulous. Had been subject to severe attacks of trifacial neuralgia present for the past five years; at times the pain was so excruciating as to be practically intolerable. The patient had consulted many prominent men without result. Complete radiographs of the head and neck had been taken with negative results. The onset of pain was usually in the region of the ala of the nose, this location becoming extremely sensitive to percussion and remaining so for a few hours. The pain then radiated backward to about the first molar region, and extreme tenderness was then present in this location, the pain then radiating backward and forward between these two points, thence upward toward the eye. Radiographs showed neither antral con-

ditions nor root fragments present and no other possibly chargeable condition perceptible. It was decided about two years ago to remove the ganglion on the affected side. Only temporary abatement of symptoms was experienced, however, and the patient now refuses further operation.

The only palliative treatment which is apparently beneficial consists of alcoholic injections. About 2 cc. of 95 per cent. alcohol is injected submucously. One cc. is first discharged at about the cuspid region, and the remainder submucously in the molar region. Slight massage is then applied, and the patient instructed to keep the part warm for a time. The symptoms at once slowly abate and temporary relief is experienced for about three months, after which time the symptoms will again manifest themselves.

REVIEW OF CURRENT DENTAL LITERATURE

[*Survey of Head Surgery*: Office of the Surgeon-general.]

1. Vincent's Angina.

REPORT ON VINCENT'S ANGINA IN U. S. A. GEN. HOSP. NO. 18, WAYNESVILLE, N. C. BY LIEUT.-COL. CHAS. E. DAVIS, M.C.

(1) The following is a report of cases of Vincent's angina occurring among the patients and detachment at this hospital.

(2) The disease is diminishing in numbers. All patients arriving at this hospital are being examined for this condition, and it has been found that a number of men on entering here have shown the Vincent organism in decayed teeth. There is a question whether or not this organism is the etiologic factor in this angina, as it is usually found in decayed teeth in many cases not associated with sore-throat.

(3) Colonel Vaughn, recently here, was also of this opinion, and further report will be made of these examinations.

From the Nose and Throat Clinic.

August 15, 1918. Attention of this clinic was called to a number of cases of sore-throat occurring among the ambulant patients. It was found that several were cases of ordinary tonsillar infection, but five or six were of the ulcerative type. Bacteriologic examination showed the presence of Vincent's organisms in the latter cases. Investigation showed that these patients were buying milk outside the grounds, and that this milk came from a dairy where sanitary conditions were deplorable. By order of the sanitary officer this source of milk was cut off, and no further cases developed. Recovery from infection was uneventful, except that several cases were admitted to the hospital wards.

Since September 16, 1918, this clinic has

investigated twelve cases of mouth infections by bacteriologic examination; eight cases showed Vincent's organisms, and four cases showed a capsulated diplococcus which has not as yet been identified. In this series there were no cases of the ulcerative anginal type, but several showed very aggravated gingivitis. In one case smears from the tonsil and incisors were negative, while a smear from an old root of a tooth showed very positive Vincent's organisms, indicating need for prophylactic dentistry.

Precautions are being taken to isolate these positive cases.

From the Dental Surgeon.

(1) Upon a routine examination of mouth conditions in this hospital a certain few cases that simulated pyorrhea alveolaris but were lacking in the usual excretion of pus were noticed.

(2) Of these cases some had associate ulcerative condition of the throat, and were referred by me to the nose-and-throat specialist for his consideration.

(3) Of seven cases referred in this way, five gave upon bacterial examination of smears taken an index of Vincent's angina. It is presumed this condition is what is now known as "trench mouth."

(4) The cases are under treatment, and so far are responding well. Treatment by this department is established as follows:

(a) A thorough prophylactic cleansing of the mouth.

(b) Instruction given to the patient in the use of a rinsing solution which contains ipecac, dioxid, and glycerin. Patient used the solution on his brush in cleansing his teeth, and diluted with water as a mouthwash.

(c) The spraying of the mouth with a pure solution of dioxid, under about eight pounds' pressure, gives great comfort to the

patient, and is done preliminary to and during the course of treatment.

From the Chief of Laboratory Service.

(1) August 15, 1918. Smears from throat of patient taken suddenly sick showed a fusiform bacillus, and a spiral organism in association characteristic of those in connection with Vincent's angina.

(2) Since that time fourteen other patients have had similar complaints, and smears were made from either the tonsils or ulcers around teeth and various parts of the mouth.

(3) The results are as follows: Nine showed the organism above described in considerable numbers. Two of these had in association and in considerable number an encapsulated diplococcus. Five showed an encapsulated diplococcus as the predominating organism without the fusiform or spiral organisms.

2. Impacted Fourth Molar.

REPORT OF IMPACTED FOURTH MOLAR. BY CAPT. H. H. BRAXTON, M.R.C.

Private A. J. M., age twenty-seven years, reported to the dental clinic, Base Hospital, Camp Hancock, Ga., June 9, 1918, complaining of a discharge of pus in the lower right posterior molar region. He gave a history of periodical acute inflammatory attacks in this region for a period of three years. Examination showed the usual number of molars to be present, and an X-ray examination was requested. This disclosed an impacted, normal-shaped supernumerary molar lying almost horizontally behind the third molar, with a large pathologic area in the alveolar process beneath it and the third molar. After blocking the mandibular nerve with novocain, the third and fourth molars were removed and the alveolar process curetted. Under frequent irrigation of the wound with saline solution the patient made a rapid recovery.

[*Monographs Rockefeller Institute for Medical Research*, No. 9, January 21, 1919.]

The Use of Blood Agar for the Study of Streptococci. BY JAMES HOWARD BROWN.

This elaborate report is fundamentally a study of method. A very extensive bibliography is appended, part of which is carefully summarized in six tables, and thirty-four plates illustrate the observations of the author. Brown had in cultivation, at the time

of writing, between 125 and 150 strains of streptococci and pneumococci. More than half of these were under observation for several years; others have been isolated from various sources from time to time. All of them have been under the author's care exclusively, and there are complete genealogical records covering every transplant and every day of the existence of each strain since it was acquired.

The medium almost invariably used was standard veal-infusion agar containing the aqueous extractives of 500 gm. of veal, 5 gm. of commercial table salt, 15 gm. of agar-agar shreds, and 10 gm. of Witte peptone per liter. The final reaction was 0.8 to 1.2 per cent. N. acid to phenol-phthalein. This agar was tubed in 12 cc. amounts. For the pouring of blood agar plates it was melted, placed in a water-bath at 45°C. for about 15 minutes, two-thirds of 1 cc. of defibrinated blood added, and evenly mixed. The tube of medium was inoculated at once with a loop or two of properly diluted 24-hour bouillon culture and poured into a Petri dish 9 cm. in diameter. The medium therefore contained 5 per cent. blood, and formed a layer 2 mm. thick in the Petri dish. With the appearance of the colonies on this medium as a criterion, there were distinguished four types of streptococci.

Type *alpha* (*a*). After 48 hours' incubation a somewhat greenish discoloration and partial hemolysis of the erythrocytes immediately surrounding the colony, forming a rather indefinitely bounded zone 1 to 2 mm. in diameter and surrounded by a second, narrow, clearer, not discolored, partly hemolyzed zone. The inner (discolored) zones were fairly constant in size and composition on all the plates. Microscopically, many of the corpuscles were seen to be present but obviously discolored, the discoloration differing a good deal in intensity for different strains of streptococci. The corpuscles remaining in the outer (clearer) zones were much fewer and never discolored. The outer zones were much more conspicuous on crowded plates than on plates containing only a few colonies. The deep colonies were small (greater diameter 0.5-1 mm.) and biconvex or complex (lobulated or asteroid), the formation of biconvex or complex colonies being quite constant and characteristic for different strains. Not only do all the green-producing

and brown-producing streptococci belong to type *alpha*, but also the pneumococcus and *Streptococcus mucosus*.

Type *beta* (β). Production of hemolyzed zones on horse-blood agar plates radically different from those of the *alpha* type. The colonies were surrounded by sharply defined, clear, transparent, completely hemolyzed, colorless zones, 2 to 4 mm. in diameter. Microscopically, no corpuscles were seen to remain within the zones. The colonies were themselves simple and biconvex, never complex (greater diameter, 0.5–1 mm.).

Type *alpha prime* (α'). This is a hemolytic streptococcus, for around the deep colonies there are distinct hemolyzed zones and no apparent discoloration. In this respect this type resembles type *beta*, but differs therefrom in one important particular, namely, the hemolyzed zones are hazy or poorly defined. Microscopically, the reason for this haziness is apparent; a few corpuscles are seen to remain throughout the zone, but are most numerous next to the colony (in this resembling the condition produced around type *alpha* colonies). The above details refer to the appearances of the deep colonies; surface colonies are by no means so distinctive. The deep colonies must be studied microscopically to differentiate between the three types, *alpha*, *beta*, and *alpha prime*.

In a sense, type *alpha prime* is intermediate between types *alpha* and *beta*, with possibly a nearer relationship to the *alpha* type. This is indicated in the first place by the presence of fixed corpuscles next to the colony, and in the second place by the response to refrigeration. In the case of streptococci of the *alpha* type, hemolysis takes place more readily during refrigeration than during incubation—this is true of type *alpha prime*; whereas during refrigeration of type *beta* colonies there is no hemolysis. Incidentally, this indicates that the hemolytic agents in type *alpha* and type *beta* streptococci may not be identical.

The fourth type of streptococcus has been designated *gamma* (γ), characterized by the fact that its growth within or upon blood agar plates occurs without the production of any perceptible hemolysis or discoloration of the surrounding medium during incubation or refrigeration. The presence of small amounts

of dextrose in the medium (as little as 0.05 per cent.) produces a marked effect.

Actively fermenting *gamma* type streptococci may produce an appreciable amount of acid hemolysis, especially noticeable in meat-extract agar, probably because of the lower "buffer effect" of this medium as compared with the meat-infusion agar. Greenish or brownish discoloration similar to the *alpha* appearance is not produced by *beta* or *gamma* types. The most noticeable effect of the presence of dextrose is the partial or total inhibition of hemolysis by actively hemolytic *beta* type streptococci. The discoloration and fixation of corpuscles by *alpha* type streptococci is encouraged by the presence of a small amount of dextrose in the medium.

Under anaerobic conditions *alpha* type streptococci and pneumococci produce *beta* type zones. If a *beta* type streptococcus is present in a colony or streak mixed with an *alpha* or *gamma* type organism the presence of either of the latter may be completely masked by the former. Corpuscles in blood agar which have been discolored greenish or brownish in the neighborhood of colonies or streaks of *alpha* type streptococci or pneumococci are no longer subject to hemolysis by *beta* type streptococci.

The *alpha* type zones are probably best explained by the theory that (1) in the neighborhood of the colony there are processes of reduction and oxidation which result in methemoglobinization of the erythrocytes, apparent as a greenish or brownish discoloration, and (2) there is released a hemolytic substance which diffusing outward from the colony attacks the corpuscles outside the region of methemoglobinization. Methemoglobinization occurs only at incubator temperature; hemolysis occurs readily at room or refrigerator temperature. A combination of these factors results in the formation of alternate concentric rings of methemoglobinized corpuscles and of hemolysis about the *alpha* type colonies when blood agar plates are exposed to alternate periods of incubation and refrigeration.

The importance of the streptococcus-pneumococcus group in dental and oral diseases and their sequelæ makes this contribution of very pertinent professional interest. In dental literature there is far too much laxity in

the nomenclature of these micro-organisms, and for the purposes of uniformity and standardization this monograph will be of far-reaching value. Type *alpha* corresponds with the *S. viridans* group; type *beta*, with the *S. pyogenes* group, and type *gamma* with the *S. fecalis* or *S. lactis* group. Type *alpha prime* probably in the past has been more frequently included in the *S. pyogenes* or hemolytic group. It is not impossible that the instances recorded of transmutation of a hemolytic type into a viridans type concerned really a representative of Brown's *alpha prime* type. His observations do not, however, throw light upon the specific transmutability of the streptococci (*cf.* Rosenow), because every effort was made to keep the strains under as uniform and as favorable conditions as possible, with the consequence that these strains were not subjected to conditions likely to call forth variations. In none of the strains was there the slightest tendency to change from an *alpha* to a *beta* type, or *vice versa*. The permanence of apparently minor characteristics of all the strains studied has been surprising.

In summary, types α , β , and γ have long been recognized. Type α' has been described here for the first time. The peculiarities of Brown's method follow:

(1) A religious regard for uniformity of culture medium and cultural conditions.

(2) An insistence that a *microscopic* study of the *deep* colonies is of great differential value.

(3) The introduction of a period of refrigeration for every strain isolated before definitive identification.

(4) A very complete, though simple, system of recording the appearances and genealogy of every strain studied.

[*Journal of the National Dental Association*,
April 1919.]

Orthodontic Appliances and Gingival Tissue. BY ALFRED P. ROGERS.

The paper is essentially a description of the finer technique with relation to the construction and application of cemented bands. Rogers believes that as a result of this technique the gingival tissues have been less endangered than formerly. The tooth which is to be banded must first be thoroughly cleaned. An accurate plaster impression is then taken.

The amount of free gum margin is carefully ascertained. The distance the operator intends his band to go under this margin is indicated on the impression by a pencil mark both buccally and lingually. Before the impression is varnished it is trimmed down to the point indicated by the pencil mark, and at right angles to the long axis of the tooth. The impression is then varnished with shellac. When thoroughly dry the operator secures a pencil made from modeling compound. The end of this pencil, having been made free from grooves or wrinkles, is then warmed to a uniform depth, leaving in the center a hard core. On its way from the flame to the impression it is quickly immersed in a receptacle of vaselin, the point only being covered. It is immediately plunged into the tooth impression, taking care that the pencil is held in the exact direction of the long axis of the tooth. When sufficiently hard the compound die is removed from the impression, when the buccal and lingual planes (flanges), each standing at right angles with the axis of the tooth, will be seen, indicating the point at which the carving of the compound representing the soft tissue shall terminate. The operator then proceeds to carve away from the tooth surface the compound representing the gingival tissue. This carving must be so carefully done that the enamel surfaces represented by the compound model are not changed or marred. Mesially and distally the base lines are allowed to curve occlusally, being continuous with the buccal and lingual planes (flanges). This surface, which is always carved at right angles with the long axis, is termed the "seat," and, when the carving is complete, determines the length and form of the gingival surface of the band. Upon completion of this carving the compound model receives a thin coat of varnish, and when sufficiently dry is inserted into a bed of plaster to which a small portion of sump has been added. When this investment is sufficiently hard, the compound is carefully softened in hot water and very carefully removed from the investment, which is then allowed to dry, and is later filled with Melotte's metal. This metal die is then removed from the investment. When this stage is reached the operator may proceed by whatever method he wishes to employ in the construction of the bands—whether it be swaged or burnished.

[*New York Medical Journal*, May 31, 1919.]

The Clinical Picture of Streptococcus Viridans Infection. BY HEINRICH F. WOLF.

The author is assured that the clinical picture is of vital importance. He limits himself to the so-called rheumatic manifestations with the exclusion of endocarditis. In the majority of the cases to which direct reference is made, the inference is apparent that the primary locus of the organism was in the dental or periodontal tissues. The borderlines between the monarticular and polyarticular manifestations on the one side and between the toxic and metastatic forms on the other are not sharp, but only artificial. In the monarticular conditions the most frequent sites of secondary viridans infection are the knee-joint, the foot, the bursa sub-acromoidalis, and the hand. Wolf has never seen such an infection in the hip-joint. Frequently there are premonitory signs in the joint, but the onset is rather sudden. There is a marked swelling of the periarticular tissue, but it is not so marked as in the gonorrheal infection, and not so painful as the latter. The temperature of the skin is increased, but there is generally no redness. On the contrary, the color of the skin is yellowish, and it has a waxy appearance. Severe as the pain may be, it is not out of proportion to the local signs. Aspirin gives only moderate relief. Brachial neuralgia is of frequent occurrence in this connection. There appears to be a marked affinity of the peripheral nerves to this organism.

In the polyarticular manifestations of these conditions, one of the earliest symptoms of secondary viridans infection is a severe pain in the finger-joints at night or toward morning. It does not last long, in fact disappears in a few seconds when one moves the joints. There is no objective sign to be seen. This symptom may last for months before other signs begin to appear. It may soon be followed by pains and aches in other parts of the body—the knees and the back, in the morning only, at first; later the pains might manifest themselves on and off during the day. During this stage the pain can be kept under control by salicylates. Gradually one or another joint begins to swell. Generally it is a phalangeal joint of the hands

between the first and second phalanx. The swelling is intra-articular, and fluid can be felt. As the disease progresses other joints become involved, particularly the knee-joints. Gradually the capsules and the synovial membranes thicken, and produce those periarticular changes which constitute the appearance of the arthritis and cause most of the symptoms. In the beginning the pain is tolerable, and the patients are able to walk to see the physician; later, however, walking becomes very difficult. The rapidity with which periarticular tissue becomes involved probably depends on whether the type of the condition has changed from a toxic into a metastatic one. When the disease progresses there are marked changes in the capsules and bursæ; the capsules become more or less destroyed, with consequent corresponding symptoms. In Wolf's opinion, a great many of the deformities are due to the large amount of fluid in the joints. The ligaments and capsules are stretched, and subluxations, so frequent in the metacarpo-phalangeal joints, develop. In this stage aspirin gives only temporary relief. One of the essential differences between the infection with streptococcus on the one hand and the infection with gonococcus, the colon bacillus, and the *Treponema pallidum* on the other, is the inefficacy of the salicylates. This does not mean that the salicylates are effective in every case of *Streptococcus viridans* infection; but even if the pain subsides only temporarily, infection with the three above-mentioned organisms may be excluded.

The differentiation of an arthritis due to *S. viridans* from that due to *S. hemolyticus* is rather difficult. In one case the diagnosis was made on the basis of the discrepancy between the objective signs and the subjective symptoms. The pain in cases due to *S. hemolyticus* is more severe and persistent than in the infection with *S. viridans*. The joints are only slightly swollen or not at all; the intra-articular fluid is scarcely increased.

[*Transactions of the Sixth International Dental Congress*, London, 1914.]

Cases of Hereditary Dental Pigmentation.

BY EDGAR H. BAMPTON.

The two cases reported appear to be indubitable instances of hereditary transmission. In the first case, the history of the family is known in this particular for five

generations, while the history of the second case extends through three generations. The two families which afford these groups of cases bear no relation to each other, although having the same peculiarities, and to a certain extent the same history. The condition does not affect all the members of each family. It does not appear to be sex-linked or to follow the Mendelian ratio. These conclusions cannot be definitive because of the relatively few cases under observation. The particular value of the report lies in the detail with which the individual cases have been studied.

The condition itself consists of a pigmentation of the enamel, dentin, and cementum with various shades of brown. It affects both the deciduous and permanent dentitions, but in the deciduous teeth the coloration is more marked in the enamel, less marked in the dentin and cementum. In some instances the pigmented deciduous incisors were erupted at birth. In other instances the deciduous teeth were non-pigmented, while the permanent teeth on eruption were pigmented. Several times Bampton reports, "The girl [boy] has white deciduous teeth, *which are gradually turning brown*, and the permanent set are erupting brown." As a rule the pigmentation is less intense in the deciduous than in the permanent teeth. The pigmentation is inclined to be patchy in places. The enamel is not very dense—not soft, and yet not quite normal—and has a dull appearance, being rough and inclined to be pitted. Hypoplasia is noted twice, but subsequent to a history of measles. No pigment patches were found on the bodies examined, and the hair, eyes, and skin are perfectly normal. No mention is made of the condition of the nails.

[*Journ. of the N. D. A.*, April 1919.]

Bacteriological Control of Dental Procedures. BY EDGAR D. COOLIDGE.

In all infected cases the operator should verify his clinical judgment of having obtained sepsis, by taking a culture from the canal. A canal saturated with any antiseptic will not give a fair test. It is necessary to wash the canal thoroughly with alcohol, followed by sterile water, absorb the water, and then seal into the canal a dry bit of cotton or absorbent paper point very thoroughly to prevent any contamination from the

outside. This should remain from twenty-four to forty-eight hours, and then be removed carefully; a smear should be examined under the microscope and a culture made, to see if the canal is free from bacteria. It must be remembered that it is impossible completely to sterilize all the dentin, but the inner exposed area can be freed from bacteria after mechanical cleaning and treatment, and then the canal should be thoroughly filled with gutta-percha.

[*International Journal of Orthodontia and Oral Surgery*, March 11, 1919.]

Dermoid Cysts Lying Within the Floor of the Mouth: Report of Two Cases.

BY M. N. FEDERSPIEL.

The first case has already been reported in the DENTAL COSMOS for March 1917. The second case was that of a colored girl of twenty-two years. When the patient was eight years of age, she noticed a swelling under her chin. Four months later it spontaneously discharged considerable pus. The wound healed, but the growth gradually enlarged, and her mandibular teeth slowly spread apart. During the past year great difficulty has been had in talking or swallowing. Examination showed the tongue forced back on account of the size of the tumor. The mass would fluctuate on palpation. Under ether, an incision three inches long was made through the skin, extending from the chin to the hyoid bone, the muscles separated, the tongue drawn forward, and pressure was brought to bear on the tongue, forcing the growth through the opening. The patient made a rapid recovery, and was discharged cured ten days after operation.

[*Journal of the National Dental Association*, April 1919.]

Mottled Enamel: A Further Consideration of an Endemic Artesian District in Virginia, Together with Data Relative to the Brava People, Cape Verde Islands.

BY FREDERICK S. MCKAY.

This is a continuation of McKay's studies which have been reported in the DENTAL COSMOS and in the *Journal of the National Dental Association*.

In the Virginia district a most confusing relationship appeared to exist between the occurrence of the enamel lesion and the use

of water from certain of the artesian wells. The examination was carried on as usual in the public schools, omitting the lower grades. In a general way it could be said that the occurrence of the lesion, which was entirely typical, was associated with the use of artesian water. The confusing feature is that subsequently to the use of artesian water, in some instances from the same well, there have been manifested in some individuals typical and even extreme cases of the lesion, while others have shown complete normality of the enamel.

If any summarization were attempted it would show that in association with artesian water the period from the beginning of its use in 1888 to about 1893 was one of lesion production. From 1893 to 1900 there is no observation of production, but five slight cases. Then, commencing again in 1900, is another active period.

An actual canvass of every native living through those periods might show very different results, but from the data on hand no other conclusion is possible. As an hypothesis, then, to account for the varying effects of these waters upon the different individuals, it is assumed either that the waters under-

went some sort of change in their chemical or other factors from time to time which were related to their lesion productiveness, or else that the physiological attributes or activities of the associated individuals were such as enabled some of them to escape, while others suffered damage to the growing enamel while subject to this influence. In this latter connection, however, it is remarkable that in no other districts properly considered endemic, excepting possibly that described as the P—— valley (see DENTAL COSMOS, 1916) were there any such physiological differences, the rule being that practically all persons growing their enamel in the same environment were afflicted with the lesion in the same typical manner.

McKay was able to study some of the Brava Islanders in the Cape Cod region of Massachusetts. Also he was able to receive reports from a number of physicians located on the Cape Verde Islands. The data so gathered emphasized the wide geographical distribution and localization of the lesion, also its endemic character, and its apparent association with the drinking-water used during the period of amelogenesis of the permanent teeth.

PERISCOPE

Polishing Vulcanite Work.—Cones made from old corks of the desired size are very much superior to those made from felt. They cut faster, do not absorb so much water, and are very inexpensive. They do not require so fluid a polishing material, hence they save clothing and laboratory surroundings from being soiled by the flying pumice.—F. W. F., *Pacific Dental Gazette*.

Casting in Cold Molds.—Perfect castings are made only in molds that have been permitted to cool to room temperature—the so-called "cold mold." A mold that is too hot to be borne comfortably on the back of the hand is a distorted mold, and a distorted inlay is the result of casting in such a mold. The hotter the mold the more distortion is present. After the wax has been dissipated and the mold cooled the casting may be done any time.—R. H. VOLLAND, *Journ. N. D. A.*

To Duplicate Plaster Casts.—Soak about 150 leaves of common gelatin in cold water for one or two hours, gradually adding four or five ounces of oil, constantly stirring. Place the cast in an enameled vessel, and pour the above mixture over it. After about two hours the mixture will have hardened, when the cast may be poured.—F. A. B., *Dental Office Laboratory*.

Stippling the Pink Vulcanite.—After the case has been vulcanized and finished in the usual manner, stipple the surface with a sharp plugger point operated with an engine mallet or electric mallet. In this way one is enabled to reproduce a more natural gum appearance. The indentations may be made more numerous between the roots, and more scattering over the root portion of the gum.—W. E. W., *Pacific Dental Gazette*.

Cementing Steele Facings.—When you contemplate cementing the Steele facings on the crown or bridge the question of shade becomes an uncertainty. This may be overcome by first trying the cement you will use under the porcelain, and predetermining the shade best suited. The powder or the mixture of powders is spatulated with pure water, and the paste used just as you do the cement. If the powder selection is correct, mix the dry powder with the cement liquid, and cement the facings to place.—F. W. F., *Pacific Dental Gazette*.

The Metric System.—The American Metric Association has recently issued a third edition of "Metric Weights and Measures," a little booklet which describes many practical methods of employing the metric system, a list of the countries in which metric weights and measures are obligatory for government work, and equivalent tables showing the relation between metric and other weights and measures, etc. The substance of this booklet has been approved by national organizations and authorities on both sides of the Atlantic, including the Decimal Association of England, and the figures given have been checked by the U. S. Bureau of Standards. With the establishment of the League of Nations the demand for information on the metric system will doubtless be very great.—*Pharmaceutical Era*.

Number of Bacteria in the Mouth.—To give one some conception of the tremendous number of bacteria in the mouth, Dr. W. Parker Harrison of Brighton, England, records in the *British Dental Journal* of May 1915, the following experiment:

Each of twelve toothbrushes was used once, rinsed ten times in a tumbler of water, and after standing for twelve hours all the bristles were removed with sterile forceps and the organisms counted in the usual way. In eight out of the twelve cases more than a million organisms were found; such a quantity of bacteria is comparable with the number of organisms found in sewerage, which is twenty-six million per cubic centimeter, and in one-sixth of the counts made on sterile toothbrushes, used only once, the number on the brush exceeds this. The volume of liquid held by a toothbrush that has had the superfluous water flicked off, as was done in these experiments, is not nearly as much as 1 cc., which renders the comparison all the more to the disfavor of the toothbrush.

These experiments were carried out by the patients suffering from periodontal diseases,

but it was also found by four experiments on an apparently healthy mouth that almost as large a number of bacteria were left on the toothbrushes.

The above experiments allow a statement that the millions of toothbrushes in this country are in a most disgusting septic state; a condition of affairs especially to be deprecated, and if possible alleviated; where septic processes are in operation in the mouth, the pyogenic organisms left on the toothbrush today are reinoculated into the mucous membrane of the mouth tomorrow.—HAROLD O. HANSEN, *Internat. Journ. of Orthodontia*.

Suprarenin in Combination with Novocain.—The action of suprarenin is in no way impaired by the combination with novocain. In fact, the anemia is much more pronounced than when used in combination with cocain. The use of suprarenin is of decided advantage in any local anesthetic, as it possesses a specific property of contracting the walls of the capillaries and small bloodvessels, thus minimizing the toxic effect of the injected solution, retarding its absorption and also creating an anemia which leaves the field of operation almost free from hemorrhage.—GEO. B. GALLIEN, *New Jersey Dental Journal*.

Restoring Lost Margins in Inlays.—When the margin of the cast inlay is faulty at the gingival or at any other part, it may be corrected by the following technique: A number of pellets of gold foil are amalgamated with a portion of mercury. The inlay is forced into its seat in the cavity, and the amalgamated gold is burnished along the margins that are to be restored. Then carefully remove the inlay from the cavity, being sure that the amalgamated gold is not forced from the inlay. This corrected inlay is now slowly heated to drive out the mercury. The gold will adhere perfectly to the inlay, and make a perfect margin.—T. C. DEMILLE, *Pacific Dental Gazette*.

Adaptation of Gold Foil to Cavity Walls.—We believe it is apparent to any thinking mind that better adaptation to cavity walls may be secured with gold foil than any other material. Indeed, gold foil is the only material with which we may use to our great advantage the elasticity of the dentin. Dentin is one of the most elastic substances known, and with gold foil we are able to spread the dentin and secure a permanent gripping of the tooth on the filling, thus securing an admirable adaptation of the gold to the cavity walls unknown in any other filling material. We thus secure a joint that

is impervious to moisture, preventing the entrance of bacterial organisms, preventing tooth discoloration, and giving to the dental pulp the greatest possible protection.

It is well to mention that malleted cohesive gold possesses high specific gravity, and is very hard and wear-resisting. It offers, therefore, the best protection to the enamel margins afforded by any of the filling materials. It gives a surface second to none in its resistance to occlusal wear. And we know of no other material, save porcelain, with which a more enduring approximal surface and contact point may be made.—JAMES M. PRIME, *Journ. N. D. A.*

Burning Out the Wax from a Casting Investment.—The case should not be heated too rapidly. The rapid rising of an invested case to a high temperature causes the wax to melt, steam to form, and a series of peculiar wax explosions to take place in the mold. Continued intense heat finally causes the wax to boil. The agitation of the wax due to explosions and boiling works out the particles of silex, graphite, etc., which are not directly held by the binder, from the walls of the mold. A casting made in such a mold comes out with a roughly etched surface. If the heat is sufficient to disintegrate the plaster more particles of silex, etc., are dislodged, and a rougher casting results. A rough casting cannot fit a cavity as perfectly as a smooth one. Furthermore, too rapid heating may cause the investment to crack and a "feathered" inlay result.—R. H. VOLLAND, *Journ. N. D. A.*

Dental Hygienist Legislation.—Another state, Michigan, has enacted a law legalizing the dental hygienist. The legislation is a part of the new dental law which was passed without opposition and at the almost unanimous request of the dental profession. The growth of the school work has forced this issue upon the profession, as there is at this time no other probable solution for handling this matter. Owing to the shortage of dentists at the present time, and the growing demand of the people for this form of preventive treatment, it seems the only practicable way in which this work can be adequately accomplished. This means that Michigan will have to provide a training-school for the dental hygienist, as there is no other way in which she can be provided. Let us hope this matter may be put on an educational basis that is comparable with the preparation now required for the professional dentist.—*Dental Register*.

The Death of Mr. Fletcher.—In spite of friendly chaff and some incredulous jibes, the doctrine of much chewing is a sound one, which, like the daylight-saving movement, has only to be properly understood to be appreciated. Mr. Gladstone is reputed to have chewed each mouthful of food thirty-two times before swallowing it. This makes for leisurely meals and conversation, the latter by those not engaged in mastication. Life, it is urged, is too short for Fletcherism—but then Fletcherism lengthens life, and so in the end the man who spends hours in chewing has quite enough time left him for other and less monotonous occupations. One can listen, one can use the eyes and even the hands, although the champ, champ, champ of the jaws goes on. Even if we cannot "swallow Fletcherism" in its entirety, we can at least adopt its main principles and avoid sloppy food and bolting our meals. "Eat slowly," we might parody the advice given in the old adage, "and all other graces will follow in their proper places."—*British Journal of Dental Science*.

Karat of Gold Used in Casting.—There has been much discussion concerning the karat of gold to be used in casting. Excellent casting can be made with 22-k, 23-k, and 24-k gold when properly handled. Twenty-two-karat gold has many qualities which make it a very desirable material for inlays in most cases. Many operators contend that only pure gold can be used to make accurately fitting inlays. They argue that pure gold has less contraction on cooling from a molten mass to a solidified state than any alloy of gold. Such statements are true. Up to the present time no rational technique has been advocated that will minimize this contraction. The gold should be heated only to a temperature that will permit it to be forced to place in the mold. The higher the temperature to which gold is brought the greater will be the contraction from the molten mass to the solidified state. Therefore, when a mold is filled with superheated gold the contraction is in proportion to the superheat. It is contended that the contraction, together with the maintained pressure used in casting, will cause more gold from the surplus in the crucible to enter the mold, and make up for shrinkage. These contentions cannot be substantiated by practical demonstration, and many valid reasons can be given to nullify the arguments. Inlays that have been cast with superheated gold do not fit the cavity in their long diameters.—R. H. VOLLAND, *Journ. N. D. A.*

Dental Treatment for Mothers.—In the county of Rutland inquiry has been made as to the health of mothers whose infants come under the notice of the health visitors. The outstanding feature of the information collected is that 117 mothers complained of very bad teeth, and 29 others had artificial teeth. Altogether 146 of the 408 visited, or over 35 per cent., had serious dental caries. In this connection Dr. Christopher Rolleston, C.M.O., writes: "The serious effects of such oral conditions cannot be exaggerated, and point to the absolute necessity of a state-supported dental service. Most educational authorities have made or are making arrangements for the dental treatment of school children. As this treatment ceases at the age of fourteen, much of the value of the work of these bodies will be impaired unless extension of the arrangements to those above school age be made. In several instances I have applied to local bodies for assistance, but, unfortunately, they are unable to help us in dental matters."—*Dental Record*.

Scientific Aspect of Removable Bridge Work.—From the scientific aspect every restoration must comply with the requirements of good surgery, good engineering, good art, and good workmanship.

Removable bridge work, requiring, as many systems do, almost universal pulp destruction in the field of operation and extravagant waste of tooth tissue, is a travesty on surgery, the function of which is to conserve and not to destroy.

The excision of the tooth crowns and the reaming of the roots to mere shells for the placement of its retaining devices, not only has nothing in common with engineering, but tears down and weakens the foundation, where engineering should maintain its integrity in the greatest possible degree, and take every advantage of its inherent strength.

In many instances the substitution of artificial teeth for the natural crowns is a distinct cosmetic loss, and the discoloration of the natural tooth following in the wake of pulp removal is frequently an esthetic calamity.—J. K. BURGESS, *Dental Items of Interest*.

Care of Teeth and Mouth During Pregnancy.—I have examined the mouths of a great many patients that were pregnant, and I invariably found gingivitis present. Physicians should insist that patients of this kind should consult their family dentist, in order to avoid this condition. During a long illness or constitutional disturbance we find an excessively acid saliva. During pregnancy there usually is an excessive flow of saliva,

with nausea, vomiting, heartburn, and an acid regurgitation from the stomach constantly bathing the teeth with acid secretions. Also in gout and rheumatism and other morbid states characterized by excessive uric, lactic, and other acids in the blood, in acid and nervous dyspepsia, causing excessive acidity in the stomach contents. The teeth and mouth should receive all needful care during any sickness.

There seems to be a great deal of discussion with regard to treatment of pregnant women. In my opinion it is a criminal act to allow a mother to suffer pain from ailments in the oral cavity. If any exist they should be corrected immediately, even to the extent of extraction of teeth if necessary, and that although the patient be a hemophiliac.—WM. W. PENSKE, *Dental Summary*.

Regeneration of the Mandible.—A patient, age sixty-five, presented himself for treatment on March 17, 1917, complaining of abundant suppuration in the region of the lower right third molar, which had been recently removed. There was an abundant discharge of pus from the socket of this tooth and from the neck of the second molar, which was loose, and so was removed at once. In front, where the first molar was missing, the fibro-mucosa was stripped up to a great extent. A large vestibular incision was made by the thermo-cautery, and the mouth was constantly irrigated during the next few days.

At the end of this treatment the suppuration was less, a few small sequestra were removed on April 21st and 28th, and on May 25th we removed one, three centimeters in length, representing the full extent of the jaw. There was a complete fracture of the mandible. Suppuration gradually disappeared.

In this case I hoped to keep the left fragment in good occlusion on account of the remaining teeth, but in a few weeks I noticed a deviation which compelled me to put in an apparatus with a double action for reduction of the left fragment by intermaxillary traction, followed by a retaining apparatus with a removable wing. The apparatus was put in position on July 2d, reduction was quickly obtained, and the wing, prepared on the model in advance, was put in position.

In spite of the advanced age of the patient the bone was regenerated, with a slight advance of the posterior fragment, and today there was only a slight mobility, which I believe will completely disappear.—DR. ROY, *L'Odontologie*.

The Problem of Articulation.—The problem of articulation will never be solved as long as we attempt to do the work with the teeth without recognizing their definite relations to the other several parts of the masticating machine. We must make a thorough study of the anatomy and movements of the temporo-mandibular articulation in both the young and old living subjects. This can be done by the aid of a good face-bow to mount accurate casts upon an articulator that will mimic as nearly as possible each individual case. Then, by carefully studying the facets of the inclined planes of the teeth, we can arrive at some real conclusions regarding the articulation of that case, and what should be the articulation of an edentulous case that has the same anatomical features. I would also suggest that each prosthetist make a number of comparative studies in articulation of the cadaver. If the results of these observations are then tabulated and published, we shall have some very valuable data that will go far toward success in the most difficult of all the fields in which we are called to work. It will remove articulation from the field of empiricism, and place it in that of rationalism.

It has been my privilege for a number of years to follow such a course of study. It has enabled me to arrive at some conclusions regarding articulation that are at variance with those set forth by the essayist. That there exists a very definite relationship between the several parts of the masticating machine is well beyond the point of theory, and quite within the realm of fact. A casual observation of the teeth in the mouth of most humans will reveal the fact that the articulation must conform to certain anatomical and fundamental relations, or the teeth will wear at the expense of certain cusps or inclined planes, or else take an irregular position in the arch. It will not take a great deal of mental gymnastics on the part of any of us to realize that a mandible of the scalene type of triangle, whose base—from condyle to condyle—measures 140 mm., would have to have a different type of articulation from one of the equilateral type measuring only 100 mm. on its base. The larger the triangle—other factors being the same—the more flattened will be the arcs upon which the teeth are articulated.—O. A. WEISS, *Journal N. D. A.*

Efficiency of Various Antiseptics and Germicides.—Alcohol behaves in a somewhat uncertain manner toward bacteria. If highly concentrated it may not sterilize at all, but a 50 per cent. mixture of alcohol and water is known to kill the common bacteria in from

ten to fifteen minutes. Spores are not destroyed by this disinfectant. Here it should be noted that alcohol and carbolic acid when mixed are relatively weaker than either drug used singly. The ordinary method of obtaining a sterile cavity by swabbing with alcohol and drying with hot air is only moderately efficient. The process should be repeated until at least five minutes have been spent over the operation, particularly if the pulp chamber is close at hand, and if the patient can tolerate the process.

Carbolic acid, or phenol, which belongs to the series of carbon compounds known as the aromatic group, is an established means of causing the death of bacteria. It is not very efficient, spores subjected to its action remaining alive. But the addition of common salt greatly increases the efficiency of its action. Many of the crude carbolic preparations are much more effective than pure phenol, rising to ten times its strength when used as a bactericide, and being indicated for use by the dental surgeon because they do no injury to his instruments. Weak solutions may be employed for storing instruments which have been boiled for three minutes, but it should be borne in mind that an instrument left too long in any chemical fluid will suffer somewhat. Alcohol, if free from water, has not this objection, but its weakness as a disinfectant must be remembered.

The essential oils are powerful and pleasant in use, being much employed to obtain sterile surfaces and cavities by the dental surgeon, with good reason to trust to their success. According to their power to cause bacterial death they may be classified in the following order, the most powerful first: Oil of cinnamon, thyme, peppermint, camphor, and eucalyptus. Thymol and camphor are very efficient used as solids—thymol more so than camphor.

There are yet many preparations and substances of use, such as hydrogen dioxid. The 10 per cent. solution is of value to the dental surgeon mainly as a cleansing and bleaching agent, for it possesses no great power to kill bacteria, although in fairness it must be said that discussion still rages about its efficiency.

Electrosol and other chlorin-containing fluids find their chief interest as being very efficient mouthwashes, if used fresh from the source of supply. There are in addition still more recent compounds, such as chloramin, acriflavin, brilliant green, and many more. For dental use they are as yet unknown; research may indicate that among them are many of great value.—ALEX. LIVINGSTON, *Dental Record.*

OBITUARY

Arthur W. Browne.

[SEE FRONTISPIECE.]

DIED, suddenly, August 30, 1918, in New York City, of angina pectoris, ARTHUR WM. BROWNE, in the seventy-third year of his age.

To the great mass of the dental profession the name of Arthur W. Browne was unknown, but his works were familiar to all of them. Intimately identified with the designing and manufacture of dental appliances for more than forty years, it is safe to say that to him were due more—and more important—mechanical devices during that time than to any other one person.

Arthur Wm. Browne, son of George and Mary (Darby) Browne, was born in Dublin, Ireland, November 24, 1845. His parents emigrated to America in 1852, and on the way over the little lad gave promise of his future career. His uncle had carved for him a small wooden boat. The boy's quick eye noted that the lines did not correspond to those of the sailing vessel they were on, and he proceeded to whittle his toy to suit.

The father was a seal-engraver of rare skill, whose work was in demand by the leading jewelers of New York City, largely for heraldic designs for wealthy Southern planters. The outbreak of the civil war cut off this source of revenue, and the boy was compelled to leave school and go to work. His ambition as a boy was expertness and experience in the making of small jewelry, mathematical instruments, machinery, etc. When other boys would be playing in the streets or idling away their leisure hours, he would be experimenting, making tools, proving mathematical and mechanical principles. As he grew older he worked in many machine and model shops, all with the thought of enlarging his experience and gaining new ideas. He also designed and patented many inventions in different fields, from the mechanical to the mathematical, and he engaged in the manufacture of some of the ap-

pliances he designed. Among the more important devices of this period was a method of working a flat lamp-wick into circular form, an invention that had a far-reaching effect in the evolution of lamp manufacture.

The result was that when in 1877 he engaged with Johnston Bros. as mechanical engineer and toolmaker his mind was almost encyclopedic in its knowledge of mechanical principles and their practical application. From then on his life was devoted to the perfection of dental devices. To this task he brought, in addition to his mechanical knowledge, the instinct of the artist combined with the cunning of the expert workman. Many departments of dental practice have enjoyed the advantages of his genius.

In 1881, with the merging of Johnston Bros.' business with that of the estate of Dr. Samuel S. White in the formation of The S. S. White Dental Mfg. Co. he entered the employ of the latter Company. Since then but few new dental devices have been brought out by the Company that did not bear some touch of his master hand; many were of his individual invention. He seemed to be able to solve any mechanical problem, and his solution was apt to be complete and satisfying. Thus, in a single night he worked out the design for the No. 7 handpiece, which stands today substantially as first made thirty-three years ago, and as now made by practically all handpiece manufacturers.

But, perhaps the most notable of his dental inventions is the Revelation bur, which introduced a new principle—the drill edge—and revolutionized the manufacture of burs. He was also the inventor of the S. S. White root-canal cleaner, automatic mallet, and Diamond chair, and of many minor improvements that have made easier the practice of dentistry. Altogether he was the father of more than one hundred patented devices, many of them of superlative merit, some of epochal significance.

His usefulness to the dental profession did

not end with the mere invention of better devices for their use. Invariably he increased the value of the invention by devising automatic machinery for its manufacture, thus assuring accuracy of construction while markedly reducing the expense of producing it and permitting its enjoyment by the profession at the lowest possible cost.

He was a thinker, fond of scientific studies; in religion a devout member and liberal supporter of the Methodist Episcopal Church from his early manhood; was active in the civic affairs of his community, his beautiful home in Pleasant Plains (S. I.) the center of ceaseless activities for the betterment of neighborhood conditions; a philanthropist in the best sense of the term. From the organization of the Richmond County (N. Y.) Building and Mutual Loan Association in 1881 till his death he was its treasurer.

A man of firm character, he was a born leader, one in whom his fellows instinctively

recognized the superior mind, and respected him accordingly; he knew how to handle men: his relations with employees and others were actuated by a spirit of justice tempered by a kindness of heart that made many seek his counsel in their difficulties.

Mr. Browne was married September 10, 1870, to Mary Paddock Hitchcock; April 21, 1892, to Bessie Virginia Carman (daughter of M. A. Carman, D.D.S.), who survives him. He had no children.

His sudden death was a blow to the devoted wife who knew his unfailing kindness and cheerful companionship; to the community that respected him; to the dental profession that benefited by his work; to the Company whose service to the profession he so enriched; to the friends who felt the magnetism of his personality and knew the innate goodness of the man, and whose hearts are sore at parting with him.

F. L. H.

DENTAL LEGISLATION

Amendments to the Dental Law of Tennessee.

AN ACT

TO AMEND CHAP. 98 OF THE ACTS OF THE STATE OF TENNESSEE FOR THE YEAR 1877, APPROVED MARCH 26, 1877, AND AMENDMENTS THERETO, ENTITLED "AN ACT TO CREATE A STATE BOARD OF HEALTH FOR THE PREVENTION OF THE SPREAD OF DISEASES IN THE STATE OF TENNESSEE AND TO CREATE A BOARD OF MOUTH HYGIENE, AND TO PROVIDE FOR A DENTAL ASSISTANT SECRETARY FOR SAID BOARD."

SECTION 1. Be it enacted by the General Assembly of the State of Tennessee that Chap. 98 of the Acts of 1877, with amendments thereto, be amended by adding thereto the following:

SEC. 2. Within thirty days after the passage of this Act the State Board of Health shall elect an Assistant Secretary of said board, who shall be a regular licensed dentist

in this state, and who shall be elected from a list of five names of regularly licensed dentists, said list to be submitted by and recommended by the State Board of Dental Examiners to the State Board of Health. Said assistant secretary shall keep his office at some central place in the state, and shall perform the duties prescribed by this Act and required by the said State Board of Health.

SEC. 3. Be it further enacted that the said assistant secretary shall give his entire time to said position, and shall receive an annual salary of three thousand (\$3000.00) dollars, to be paid monthly upon warrant drawn by the State Comptroller, and his traveling and other necessary expenses while employed on the business of the board shall be allowed and paid.

SEC. 4. Be it further enacted that the duty of said assistant secretary shall be to have

general supervision of the interests of health and life of the citizens of this state, with especial reference to the care and preservation of the mouth and teeth. He shall instruct the pupils of the public schools and inmates of the charitable institutions of the state in the importance of the care and preservation of the teeth. He shall lecture to the teachers of said schools and institutions with the purpose in view of securing their assistance in having the pupils of said schools carry out his instructions. He shall have general supervision over the dentist and dental equipment in the various State Institutions. He shall distribute such literature throughout the state as will inform the people in the proper way to care for the teeth, and shall submit an annual report to the Governor and the Tennessee State Dental Association on the work done by him.

SEC. 5. Be it further enacted that to assist him in carrying out the duties of his office he shall be authorized to appoint a reputable dentist in each county seat, who shall serve without compensation and shall be known as County Mouth Hygienist.

SEC. 6. Be it further enacted that this Act shall take effect from and after its passage, the public welfare requiring it.

AN ACT

TO AMEND CHAP. 108 OF THE ACTS OF 1891 OF THE GENERAL ASSEMBLY OF THE STATE OF TENNESSEE. ENTITLED "AN ACT TO REGULATE THE PRACTICE OF DENTISTRY IN THE STATE OF TENNESSEE AND TO PUNISH VIOLATIONS THEREOF," AND THE AMENDMENT THERETO, BEING CHAP. 39 OF THE ACTS OF 1913, FIRST EXTRA SESSION OF THE GENERAL ASSEMBLY OF THE STATE OF TENNESSEE, PASSED AND APPROVED SEPTEMBER 27, 1913.

SECTION 1. Be it enacted by the General Assembly of the State of Tennessee, that Chap. 108 of the Acts of 1891 of the General Assembly of the State of Tennessee, entitled "An Act to Regulate the Practice of Dentistry in the State of Tennessee, and to Punish Violators thereof," and the Amendment thereof, being Chap. 39 of the Acts of 1913, First Extra Session of the General Assembly of the State of Tennessee, be amended as follows:

SEC. 2. Be it enacted that Sec. 5 of Chap. 39 of the Acts of 1913, passed at the First Extra Session, passed and approved September

27, 1913, be and the same is hereby amended to read as follows: Every licensed dentist in the State of Tennessee shall register his license with the State Board of Dental Examiners through the office of the secretary of said board on the first day of July of each year beginning with the year 1919, upon blanks to be furnished by the secretary of said board. For each registration there shall be paid to said board a fee of one dollar. The said board shall issue to each dentist so registering a certificate of registration. Said certificate of registration shall be recorded with the county court clerk in a book kept for that purpose, in the county or counties in which said dentist is practicing. Said clerk is authorized to collect a fee of fifty cents for each certificate recorded as compensation for his services; *provided, however*, that it shall be necessary to file with the county court clerk only the first certificate of registration issued to each dentist by the said Board of Dental Examiners in the county or counties in which said dentist is practicing.

SEC. 3. Be it further enacted that Sec. 9 of Chap. 39 of the Acts of 1913, First Extra Session, be and the same is hereby amended so as to read as follows: Any failure, neglect, or refusal of any person licensed to practice dentistry by the State Board of Dental Examiners to register said license with said board as herein provided within sixty days after July 1st of each year shall work a forfeiture of such license, and no license when once forfeited shall be restored except upon payment to said board of a penalty of ten dollars for each such failure, neglect, or refusal to register such license. Any failure, neglect, or refusal of any dentist to record with the county court clerk of the county in which he practices, said first certificate of registration issued by said State Board within sixty days after the issuance of said first certificate by said State Board shall likewise work a forfeiture of such license, and no license when once so forfeited shall be restored except upon payment to said board of a penalty of ten dollars for each such failure, neglect, or refusal to record such certificate of registration.

SEC. 4. Be it further enacted that Chap. 39 of the said Acts of 1913, First Extra Session, be amended by striking out of lines 12 and 13 of Sec. 4 as printed, the words and figures "fifteen dollars (\$15.00)," and substituting therefor the words "twenty-five (\$25.00) dollars," so as to make said sentence in said 4th Section of said Act to read, "Application shall be made to said board in writ-

ing for license, and shall in every instance be accompanied by an examination fee of twenty-five (\$25.00) dollars, which sum is authorized to be charged each applicant for each examination by said board."

SEC. 5. Be it further enacted that Sec. 11 of Chap. 39 of the Acts of 1913, First Extra Session, be and the same is hereby amended so as to read as follows: All moneys received by said State Board of Dental Examiners shall be held by said board as a fund for defraying legitimate expenses of said board. Said board shall make an annual report of its proceedings to the Governor of the State and to the State Dental Association at its annual meetings. These reports are to be in pamphlet form and to show all moneys received and disbursed in pursuance of this Act.

SEC. 6. Be it further enacted that any dental dispensary, infirmary, or school legally incorporated and recognized by the State Board of Dental Examiners as maintaining the proper standard and equipment may establish for female students a course of study in Mouth Hygiene. All such students upon entrance to such dispensary, infirmary, or school must be of good moral character and have had one year in high school, and shall present such other evidence of qualifications as may be required by said dispensary, infirmary, or school, and may be graduated in not less than one collegiate year as Dental Hygienist, upon complying with the preliminary and professional requirements as to examinations established by said State Board; *provided*, that no person shall be graduated as

dental hygienist who is under twenty years of age. Upon payment of a fee of twenty-five dollars, after having satisfactorily passed such examinations, they shall be licensed and registered as dental hygienist by said State Board of Dental Examiners under the rules and requirements as prescribed for the registration and licensing of dentists.

SEC. 7. Be it further enacted that any regularly licensed and registered dentist may employ such licensed and registered dental hygienist. Such dental hygienist may remove lime deposits, accretions, and stains from the exposed surfaces of the teeth and polish same, but shall not perform any other operation on the teeth or tissues of the mouth. They may operate only in the offices and under the general direction or supervision of a licensed and registered dentist. Nothing herein shall be construed as authorizing any dental hygienist to perform any operation in the mouth without such supervision.

SEC. 8. Be it further enacted that said State Board may revoke the license of any dentist who shall permit any dental hygienist operating under his supervision to perform any operation other than that permitted under the provisions of this Act, and said board may also revoke the license of any dental hygienist violating any of the provisions of this Act.

SEC. 9. Be it further enacted that all laws or parts of laws in conflict with this Act are hereby repealed.

SEC. 10. Be it further enacted that this Act take effect from and after its passage, the public welfare requiring it.

DENTAL COLLEGE COMMENCEMENTS

Cincinnati College of Dental Surgery.

THE annual commencement exercises of the Cincinnati College of Dental Surgery were held at the Business Men's Club, Cincinnati, Ohio, May 29, 1919.

Addresses were made by E. W. Wilkinson, president of the board of trustees, and Dr. G. S. Junkerman, dean.

The degree of Doctor of Dental Surgery was conferred upon the following graduates:

Merlyn P. Adams
William C. Coughlin

Paul J. Hughes
Ralph R. Lockhart

Everett L. Morris
Maurice Slutsky

Leroy A. Trubee
Nathan Unger

University of West Tennessee, Dental Department.

THE commencement exercises of the Dental Department of the University of West Tennessee were held in Memphis, Tenn., on May 12, 1919.

The commencement address was delivered by S. W. Broome, A.M., D.D., editor of the *Memphis Times*.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Travis E. Davis

Joseph W. Motley

James H. Patterson

University of Nebraska, College of Dentistry.

At the annual commencement exercises of the College of Dentistry of the University of Nebraska, held in Lincoln, Nebr., the degree of Doctor of Dental Surgery was conferred on the following graduates:

M. E. Bockemuehl	R. J. Hinman	P. G. Ludwick	C. H. Pitzer	C. H. Swanson
L. O. Edgar	E. J. Horner	C. F. McCue	L. A. Proskovee	H. E. Swanson
P. D. Fleming	C. B. Johnson	Bernard McHugh	D. H. Reinhardt	C. L. Thompson
H. F. Fuerst	S. C. Koebele	G. E. Mahan	Charles Rider	F. E. Thompson
H. M. Gradwohl	E. E. Laidig	P. B. Muffy	L. V. Sharp	A. A. Tschanner
R. C. Groom	G. K. Leschinsky	L. G. Neff	P. E. Sheehan	Carlos Waldheim, Jr.
Carl Gunther	C. A. Linch	C. R. Peterson	I. P. Swanbom	Howard Yost
H. E. Harris				

Vanderbilt University, School of Dentistry.

THE annual commencement exercises of the School of Dentistry of Vanderbilt University were held at Nashville, Tenn., on Monday evening, May 26, 1919.

An address to the graduates was delivered by Rev. George Stoves.

The degree of Doctor of Dental Surgery was conferred by Chancellor James H. Kirkland, A.M., Ph.D., LL.D., on the following graduates:

Claude A. Adams	North Carolina	Jean L. Martin	Texas
Isaac B. Baker	Texas	Robert F. Mims	Alabama
Marion J. Barnett	Tennessee	Everette W. Moncrief	Alabama
Robert H. Blane	Tennessee	Edward A. Perry	Alabama
Cleo C. Boles	Tennessee	Mark S. Richardson	Tennessee
Thomas E. Braly	Alabama	Frank M. Robinson	Texas
James E. Brown, Jr.	Texas	John M. Rodgers	Texas
Charles E. Butler	Mississippi	Xavier E. Sanders	Kentucky
Joseph M. Cheek	North Carolina	Nolan W. Sherman, Jr.	Tennessee
Cecil H. Dowell	Tennessee	William F. Slaughter	Texas
Roberdeau M. Dunn	Mississippi	Thomas E. Sikes	North Carolina
Roy O. Elam	Tennessee	Robert G. Smith	Iowa
Albert E. Edmonds	Alabama	Paul D. Srygley	Tennessee
John S. Gillespy, Jr.	Alabama	Edward A. Swafford	Texas
Charles M. Grizzle	Tennessee	Jikuma Tahara	Japan
Thomas C. Henslee	Tennessee	Clyde C. Thompson	Arkansas
J. Wendell Hooke	Kentucky	Edwin F. Vogelpohl	Minnesota
J. Milton Hoskins	Mississippi	Francis A. Webb, Jr.	Alabama
Prunett A. Kelly	Tennessee	James R. Willis	Arkansas
Arthur E. Kruse	Texas	Loomis H. Wood	Tennessee
Dewey R. Linder	Mississippi	Fred W. Wright	Mississippi
Samuel G. Lowry	Tennessee		

Howard University, Dental College.

At the annual commencement exercises of the Dental College of Howard University, held in Washington D. C., the degree of Doctor of Dental Surgery was conferred on the following graduate:

Campanini D. Lister

McGill University, Department of Dentistry.

At the annual convocation of the Department of Dentistry of McGill University, held in Montreal, Can., the degree of Doctor of Dental Surgery was conferred on the following graduates:

Lt.-col. F. H. Bradley	Quebec	N. Lande	Montreal
R. W. Edmison	Montreal	C. F. Morison	Montreal
A. C. Jack	Montreal	W. H. Wisse	Montreal
M. Kolber	Montreal		

Tulane University, School of Dentistry.

At the annual commencement exercises of the School of Dentistry of Tulane University, held in New Orleans, La., 1919, the degree of Doctor of Dental Surgery was conferred on the following graduates:

Alfred L. Aiken	Otto L. Colee	Paul D. Henry	Asa A. Meredith
Clyde R. Bailey	Eric W. Day	Carlos Hernandez	Milton B. Pearce
Julius H. Barnes	George W. Dubuisson	Samuel F. Hinton	John B. Poindexter
Anthony J. Bartlett	Edwin Dunn	(Mrs.) Alma M. Joly	Roger Poirier
Telle A. Beauchamp	Alvin J. Fillastre	Paul Knittel Jr.	Jewell C. Roberts
Joseph W. Blount	John A. Foster	John D. Kuebler	Glen L. Rye
Ralph A. Brownfield	Frederick G. Framhein	Joseph M. Lima Jr.	Daniel B. Torn
John L. Bullard	Francis L. Hart.	Emile D. Meetze	John A. Wadlin

Western Dental College.

At the annual commencement exercises of Western Dental College held in Kansas City, Mo., the degree of Doctor of Dental Surgery was conferred on the following graduates:

A. S. Barlow	C. H. Faubion	H. V. Herider	F. McKain	L. H. Stephens
M. I. Barlow	J. H. Fay	C. E. Hill	K. McKenzie	W. M. Stivison
C. E. Barngrover	T. C. Fitzgerald	J. P. Hoffman	R. A. Mackie	F. H. Swisher
E. E. Benson	R. Frieburghouse	C. B. Holt	A. Maniatis	L. R. Taber
G. T. Bonifield	I. D. Galbraith	J. W. Hooper	C. R. Marker	J. A. Tankard
C. Brown	R. A. Glitzke	E. G. Hull	T. L. Meehan	F. C. Taylor
E. A. Christman	J. Goeringer	H. C. Jedlicka	L. B. Montgomery	A. L. Thelin
L. G. Collier	W. A. Haas	J. C. Jones	O. T. Moody	C. T. Toole
E. A. Crevier	L. C. Harness	L. M. Jones	H. H. Mundy	F. A. Turner
C. Daigger	L. D. Harper	L. A. Kelly	H. A. Nance	G. L. Turner
G. N. Daily	J. S. Hawkins	L. Kinzy	A. Ramsey	T. E. Voigt
C. A. Denny	P. O. Hayden	E. D. Light	A. W. Riddle	C. L. Wade
F. DeWitt	W. N. Heard	J. Lintz	E. B. Riley	H. G. Williams
J. A. Edmondson	W. B. Hedge	R. O. McCandless	J. A. Scrivener	O. B. Wilson
C. M. Ekblad	C. W. Henry	H. H. McGee	G. L. Smith	S. Wimmer
G. E. Eldridge	R. G. Henry			

Laval University, School of Dental Surgery.

At the commencement exercises of the School of Dental Surgery of Laval University, held in Montreal, Can., the degree of Doctor of Dental Surgery was conferred on the following graduates:

F. Bourgeois	J. H. D. Champagne	J. Guimond (Miss)	E. Landry	L. Robert
A. Béland	J. Charpentier	R. Hébert (Miss)	R. Lavallée	H. St-Onge
R. Bélanger	R. Chênevert	Jules Huot	L. O. Léger	A. Scheffer
A. Brien	E. Cournoyer	I. Labelle	A. Lessard	J. A. Thibaut
A. Cardinal	W. Dufour	J. E. Laforest	J. L. Prévost	

Baylor University, Dental Department.

At the commencement exercises of the Dental Department of Baylor University, held in Dallas, Texas, the degree of Doctor of Dental Surgery was conferred on the following graduates:

James Avann	R. A. Douglas	D. L. Mann	Emmett A. Sibley	Henry L. Wille
A. J. Blackwell	O. L. Garrett	C. L. Oliver	J. A. Skinner	Paul M. Woods
H. L. Bloom	Edward M. Green	J. B. Parmelly	G. L. Smith	G. W. Collins
T. R. Burnham	R. R. Hall	B. E. Phillips	C. W. Spear	A. A. Darilek
E. T. Callahan	V. E. Harmon	R. R. Ramey	C. B. Standley	Y. C. Lovelace
C. W. Cheatham	J. G. Hicks	W. H. Rickles	W. B. Stevenson	E. C. McAlpin
D. M. Colquitt	J. D. Hyde	M. J. Rochelle	Jack Stringfellow	W. Z. Morrison
E. J. Cooper	J. E. Kalbfleisch	Hodge Sellers	W. T. Wells	W. T. Payne
A. C. Coward	W. D. La Taste	F. M. Shultz	C. E. White	J. W. Wagener
W. F. Cummins	G. A. McJimsey			

Atlanta-Southern Dental College.

At the annual commencement exercises of Atlanta-Southern Dental College the degree of Doctor of Dental Surgery was conferred on the following graduates:

J. L. Aiken	Guy Denny	L. L. Huckaby	H. W. Miller	E. W. Shepherd
E. D. Anderson	J. W. Denny	Mrs. A. J. Hurst	J. D. Miller	O. D. Sibert
F. W. Anderson	B. J. Durham	C. B. Jennings	C. D. Moreland	C. C. Smith
S. C. Baker	H. H. Durham	B. M. Johnson	M. M. Moreman	H. L. Smoke
G. C. Barnard	H. A. Edwards	D. W. Jones	J. D. Muse	F. C. Sneed
W. S. Beasley	Miss M. Ferrell	O. O. Jones	W. A. Newsome	W. C. Stone
J. G. Bennett	C. G. Fuquay	R. L. Jones	J. G. M. Nichols	S. H. Strawn
C. A. Blackburn	K. Funderburke	S. P. Jones	C. C. Noble	H. T. Strickland
A. B. Bland	B. E. Gatlin	H. W. Jordan	P. E. Nobles	Roy Summerlin
D. B. Bissett	S. P. Gill	A. G. Kennedy	J. E. Osborne	B. A. Sutton
S. L. Bobbitt	C. H. Glass	L. W. Knight	A. L. Owens, Jr.	R. Taylor
S. Bridgers	J. S. Golden	H. W. Lanford	R. E. L. Patillo	J. L. Thomas
B. J. Brown	B. B. Goodner	F. O. Lentz	R. M. Patterson	E. L. Thompson
J. B. Brown	C. A. Graham	L. L. Lowery	J. W. Phillips	J. I. Todd
L. E. Buie	T. L. Graham	M. Lozier	C. A. Pless	J. M. Toomey
P. L. Bumgardner	F. W. Griffin	C. S. McCall	R. W. Powell	C. S. Tuggle
C. L. Busbee	H. B. Grose	I. H. McKaughan	J. C. Pullen	W. S. Wehunt
— Capps	H. B. Gunn	R. S. McKay	I. N. Ranes	Joel White
B. G. Carnathan	S. Hadas	L. C. McKnight	J. F. Reece	C. W. Williams
W. W. Carpenter	H. G. Harding	D. B. Mann	W. G. Reeves	W. S. Wilson
G. K. Carter	F. H. Harrison	R. W. Malone	V. H. Rouse	W. O. Withers
— Casey	H. S. Henry	C. J. Masters	W. Rowell	G. R. Wolfe
D. B. Caswell	W. E. Holley	B. L. Martin	M. Rubin	T. L. Young
J. W. Coe	P. B. Holliday	Rex Matheny	— Sabitsman	J. F. Zachary
D. H. Crawford	B. O. Holtzendorf	R. J. May	A. M. Schutzman	T. H. Zetterower
O. D. Dellinger	H. L. Holtzendorf	Mrs. R. Meckle		

Royal College of Dental Surgeons.

At the commencement exercises of the Royal College of Dental Surgeons, held in Toronto, Ont., the degree of Licentiate of Dental Surgery was conferred on the following graduates:

Elmer S. Aitken	Luke G. Fraser	John L. McGowan	Arthur Poyntz
Walter G. Alston	Albert V. Gardner	William M. McKay	Norman J. Quigley
Waldo K. Barkley	W. Orville Godwin	J. C. MacLaurin	Samuel M. Richardson
Alex E. Barnby	Lucien Gravel	Samuel M. McLeod	Herbert C. Roach
Harvey G. Bean	Ralph W. Hall	John L. Mackle	Earl J. Robinson
Milton C. G. Bebee	Robert A. Hart	Alexander A. MacPhee	Colin T. Russell
Russell Bishop	Harold A. Hartford	Rupert P. Millan	H. A. Saunders
Murray H. Blandin	William N. Hayes	James A. Milne	Walter L. Sawyers
Eldon T. Carrothers	Harold W. Hoag	George F. Mitchell	George L. Shannon
Arthur E. Chegwin	Edward W. Holmes	James G. Montgomery	Roy D. Shortreed
Thomas C. Clemence	Alvin M. Hord	Stephen A. Moore	George A. Sirrs
Aime Couture	Richard I. Hotham	Joseph F. Morton	Abram Slone
Stanley S. Crouch	Wilson LaV Hugill	Charles E. Moyer	Earl P. Smith
Chauncey Daryaw	Wallace M. Johnson	Gordon S. Murray	William H. Smith
Raoul L. Des Rosiers	Harold Johnston	William Murray	Wilson D. Smyth
John H. Dickson	Alun W. Jones	Alban L. Norton	Louis W. Staples
Stanley R. Dickson	Hubert F. Klopp	Charles R. Oke	Charles E. Stewart
Gordon Dodge	A. N. Laidlaw	Edward J. O'Leary	James L. Stewart
Lawrence D. Drew-Brook	Martin P. Lamey	Benjamin M. Ott	Raymond M. Watson
Duncan J. Ferguson	Julius J. Lavine	Jack W. Pickard	Arthur D. Wood
Donald M. Flett	George H. Levesque	Arthur R. Poag	Roy A. Wright
Claude J. Foley	Herbert J. McCann		

ARMY AND NAVY DENTAL NEWS

Assignments.

Army Dental Corps.

Week ending May 17th.

Col. Alden Carpenter to Washington for duty in attending surgeon's office.

Lieut.-col. John A. McAlister, Jr., and Maj. James G. Morningstar to Newport News, Va., port of embarkation, for duty.

Week ending May 24th.

Maj. Aaron F. Eidemiller and Capt. Edward A. Thorne to Panama Canal Department for duty.

Capt. Luther C. Whitlock to port of embarkation, Hoboken, N. J., for duty.

Week ending May 31st.

Capt. Edward M. Atkinson to Fort Leavenworth, Kans., for duty.

Week ending June 7th.

Lieut.-col. Raymond E. Ingalls to Philippine Department, for duty as department dental surgeon.

Maj. Oscar G. Skelton to France for duty.

Capt. Harold H. Buehler to Hoboken, N. J., port of embarkation, for duty.

Capt. Cline S. Beurmann to Fort Des Moines, Iowa, general hospital 26, for duty.

Capt. Byron S. Behney to general hospital 31, Carlisle, Pa., for duty.

Capt. Wm. F. Blair to San Francisco, Letterman General Hospital, for duty.

Week ending June 14th.

Lieut.-col. Rea P. McGee and Capt. Edmund J. Kelly to Jefferson Barracks, Mo., for duty.

Maj. Crittenden Van Wyck to Fort McPherson, Ga., general hospital 6, for duty.

Capt. Eugene F. Rockafeller to Americus, Ga., Southern Field, for duty.

Capt. Richard F. Thompson to France for duty.

Capt. Leroy T. Asche to Hoboken, N. J., port of embarkation, for duty.

Capt. Clayton A. Patterson to Fort Leavenworth, Kan., for duty.

Capt. John L. Remsen to Walter Reed General Hospital, D. C., for duty.

Navy Dental Corps.*Week ending May 17th.*

Lieut. (Jn.Gr.) C. E. Garcia, detached from duty on Oregon; to duty in 12th naval district.

Lieut. (Jn.Gr.) C. B. Johnson, detached from duty on Pretoria; to duty under command of cruiser and transport force.

Lieut. J. M. Campbell, detached from receiving ship at New York; to Newport News, Va., for duty with cruiser and transport force.

Lieut. (Jn.Gr.) P. A. Fowler, detached from duty at navy yard, New York, N. Y.; to duty on the Arkansas.

Lieut. (Jn.Gr.) G. L. Reilly, detached from duty at naval training camp, Hingham, Mass.; to duty on the Hampshire.

Lieut. (Jn.Gr.) C. B. Morse, detached from duty at the naval training station, Newport, R. I.; to duty at Otter Cliff radio station, Bar Harbor, Me.

Lieut. William B. Nash, detached from duty 9th naval district; to duty under command cruiser and transport force.

Lieut. (Jn.Gr.) Charles B. Johnson, Pretoria, revocation of orders; detached from duty Pretoria; to duty naval training station, Great Lakes, Ill.

Week ending May 24th.

Lieut. (Jn.Gr.) Cornelius L. Norris, detached from 5th naval district; to naval dispensary, Navy department.

Lieut. (Jn.Gr.) Nicholas S. Duggan, detached from duty in 12th naval district; to duty on the Alert.

Lieut. L. B. Lippman, detached from N. O. T. S., Baltimore, Md.; to U. S. S. Fulton.

Lieut. (Jn.Gr.) C. C. Tinsley, detached from U. S. S. Kentucky; to U. S. S. Alabama.

Lieut. W. F. Baron, detached from duty aboard the Alabama; to duty at the naval station, Key West, Fla.

Lieut. (Jn.Gr.) A. L. Keltie, detached from duty at the naval air station, Rockaway Beach, L. I., N. Y.; to duty aboard the Rhode Island.

Lieut. (Jn.Gr.) A. C. Tollinger, naval port office, Southampton; to headquarters, London.

Week ending May 31st.

Lieut. (Jn.Gr.) J. E. Herlihy, Constantinople, to U. S. S. Tonopah.

Lieut. (Jn.Gr.) J. A. Waters, detached from duty at the naval training station, Great Lakes, Ill.; to duty at the navy yard, Philadelphia, Pa.

Lieut. Rufus A. Ferguson, detached from receiving ship, New York; to navy yard, Philadelphia.

Lieut. (Jn.Gr.) Samuel Kalison, detached from duty on navy rifle range, Wakefield, Mass.; to duty naval air station, Chatham, Mass.

Lieut. (Jn.Gr.) Frederick Wolfsohn, detached from duty on Zeppelin; to duty 12th naval district.

Week ending June 7th.

Lieut.-commander Leon Martin, detached from U. S. Naval Academy; to U. S. S. Solace.

Lieut. (Jn.Gr.) H. K. Lambert, detached from temporary duty receiving ship at New York; to duty aboard the Harrisburg.

Lieut. (Jn.Gr.) Maurice Spack, detached from duty at the federal rendezvous, Brooklyn, N. Y.; to duty aboard the Mercury.

Lieut. (Jn.Gr.) A. H. Hetler, detached from duty aboard the Harrisburg; to duty at the navy yard, Philadelphia, Pa.

Lieut. A. T. Fellows, detached from U. S. S. Solace; to Marine Expeditionary Forces, Haiti.

Lieut.-commander L. C. Williams, detached from naval training camp, Pelham Bay Park, N. Y.; to naval academy.

Lieut. Canute Hansen, detached from training station, naval operating base; report 5th naval district for duty naval operating base (5th naval district).

Lieut. George C. Fowler, detached from receiving ship, New York; to U. S. S. Prairie.

Week ending June 14th.

Lieut. James M. Campbell, detached from cruiser and transport forces; to U. S. S. Matsonia (cruiser and transport forces).

Lieuts. Horace C. McElderry and John E. Tibbets, detached from duty on receiving ship at Norfolk, Va.; to duty on receiving ship on shore naval operating, Hampton Roads, Va.

Lieut. (Jn. Gr.) Frank S. Oser, detached from duty Nansemond; to duty naval station, New Orleans, La.

Lieut. E. H. Zimmer, reported from U. S.; ordered to Inverness.

Lieut. (Jn. Gr.) DeW. C. Emerson, reported from U. S.; to associated duty, headquarters, London.

Lieut. Robert M. Askin, detached from Naval Academy; to U. S. S. Solace.

Lieut. (Jn. Gr.) Chester A. Beam, detached from duty at navy yard, New York; to duty on the Connecticut.

Preparedness League of American Dentists.

ORGANIZED UNDER THE AUSPICES OF THE N. D. A.

Preparedness League Notes and News.

R. OTTOLENGUI, *Publicity Committee.*

FROM PRESIDENT BEACH.

"WHERE there is no vision the people die." These words of the prophet seem to have been written especially for the dental profession. If we have no vision we must die. The great things that are immediately before us are merely awaiting our vision and effort to make them practical realities.

The call of progress and humanity is ringing from end to end of the civilized world as never before. As a profession we must appreciate this, and through it derive the benefits from the war which are within our grasp. Our experience in the last few months in endeavoring to put forward different plans with this object in view has been quite discouraging. We seem to have dismissed the whole matter from our minds and are confining our energies to our own selfish interests. For the sake of our profession's future, let us carry the banner of *service* to the highest peak of mastery, that it may be seen and known throughout the world.

OUR CHANCE TO BEFRIEND OUR BROTHER DENTISTS.

"To give is but to receive." Our brother dentists of devastated France and Belgium need immediate help. The Germans drove them from their offices, appropriated their equipment, separated them from their families, and in many cases completely destroyed their towns. A majority took up arms and fought in the trenches, many of whom were killed, while many more were partially or wholly incapacitated. There are hundreds of cases where the wives and children of our brother dentists have suffered unspeakable tortures and are now without means of sustenance and support.

Let the dental profession take care of its own. These dentists are our brothers! Their trials, ambitions, hopes, and lives have been the same as ours. Through the ravages of the diabolic Hun they are today without means to help themselves. Will we not stretch forth a helping hand? Will we not

give them a brotherly and fraternal hand-clasp and put into their exhausted spirit renewed hope, renewed ambition? Place yourself in their position and think what assistance would mean to you, especially when it comes from a source with which your life-work has been identified. Let the contributions of American dentists be their means of rehabilitation! Is it not a glorious thought? Let us muster our forces and carry forward to success this splendid object!

Following is an excerpt from a letter from Dr. Georges Villain of Paris:

"The dentists of the North of France and Belgium have suffered terribly during the war. The Germans have removed and taken to Germany or destroyed all their material. Other dentists, half of the French practitioners, have left their offices since August 1914, and will have to build over their practice. Some have been wounded to an extent that will oblige the use of special outfits to enable them to carry on their professional activities. Others are mutilated and will not be able to practice any more.

"Our professional brothers have given their lives, their limbs, or their wealth, which amounted sometimes only to the value of their material, for the cause of liberty and freedom of the world, which is the cause of every one of us; by what they have given we have benefited—that is why we cannot do too much. France has so much to do, and everyone over there suffered so much, that we cannot expect much better results than the one obtained."

Through the marvelous skill of Dr. Villain and associates, fully 250,000 men who were injured by the war have been dentally restored and duly returned to the fighting lines.

In 1915 the Société de l'Aide Confraternelle was organized by French and Belgian dentists for the following purposes:

- (1) To facilitate the return to normal life of all colleagues severely injured by the war, by giving to them or advancing as an honorable debt the necessary means to re-establish themselves; and

(2) In the invaded districts to help in the reconstruction of destroyed homes and in newly equipping dental offices devastated by the enemy, so as to enable dentists to resume their practice.

A little more than \$20,000 was raised, which amount was wholly inadequate to meet the demands. Our brother dentists of France have exhausted their resources and cannot do more without aid from us.

All funds raised by the Preparedness League of American Dentists will be sent to the treasurer of l'Aide Confraternelle, and judiciously disbursed according to the most worthy and pressing cases. A committee of American dentists in France will assist in directing the work.

A recent letter from Dr. E. C. Kirk states: "I have just returned from Europe, and I can assure you that there is abundant need for every item of help we can render in the rehabilitation of our colleagues who have lost everything in the war-devastated areas."

Lieut.-Col. Laflamme (successor to Colonel Logan in the Surgeon-general's office) states: "Your communication having reference to the furnishing of equipment for the French and Belgian dentists received. Wish to inform you I can safely and frankly state this office will, as in the past, be ready to support any movement that has for its end such lofty and generous ideas as mentioned in your letter."

Now is the time to show a true spirit of helpfulness where most needed. A strict accounting will be made to all contributors and every protection afforded the handling of funds.

Make all checks payable to Dr. L. M. Waugh, treasurer Preparedness League of American Dentists' Fund for French and Belgian Dentists, 576 Fifth Ave., New York, N. Y.

J. W. BEACH, *President*.

WE publish herewith an appeal from l'Aide Confraternelle through Dr. Ch. L. Quincerot, secretary:

AN APPEAL FROM "L'AIDE CONFRATERNELLE."

"Now that the war is over, a great number of practitioners (some having left their profession on account of the mobilization, others having been forced by the enemy to leave their home) would like to get back to their practices.

"In what condition will they find their home?

"Will they be able to work as before the war?

"What will be their financial condition?

"Will it be possible for them to return to their professional life without any help?

"Our duty toward these practitioners, who have been compelled to leave their work on account of the mobilization, is to help them as much as we can.

"To do so, it is necessary to get together and give all we can to help them to reorganize their business, which has been destroyed by the war.

"Our treasurer knows that you will not forget them.

"The names of the subscribers will be published from time to time in the dental press. We rely on the professional press to help us also by publishing our appeal.

"Kindly send all subscriptions to our colleague, M. FRESNEL, treasurer of this organization. Address: 8, rue Notre-Dame-de-Lorette, Paris.

"CH. L. QUINCEROT, *Secrétaire-gén.*,
"28, rue de Moscou, Paris VIII."

A Report of French-Belgian Relief Work.

OUR campaign for raising funds for French and Belgian dentists is now well under way and is meeting with hearty support by the profession. It is evident that American dentists realize that they have an opportunity to be of great assistance to their professional brothers at the time of their greatest need.

It has been ascertained that adequate equipment for the average French and Belgian dentist can be obtained for \$500. The League hopes to secure a contribution from each state of at least this amount, and each dentist established will be designated as a beneficiary of a certain state. He will thus be made accountable, as it were, to the state named, and a periodical report rendered if so desired. In other words, each state may take one or more dentists under its wing, as it were, and through this plan have individual as well as collective interest in this great work. Individual contributions will be grouped so that each donor may be informed of its ultimate use in order to lend a personal touch to our work.

Capt. Blake A. Sears, of the Replacement Depot, Dental Corps, St. Hignan, France, says in a recent letter:

"l'Aide Confraternelle is O. K. They are doing a good work, and much praise should be given them.

"As for the Belgian dentists, from all that

I can learn, they are anxious for someone to finance them and let them alone. At the present time many of these dentists are sending their patients to the American camps for the necessary dentistry, and telling their patients that they cannot do the work, as they cannot purchase materials.

"The French dentists in this sector are not doing any dentistry. They just say that they have all they can do to get food at present without thinking of practicing dentistry, as the people are without the necessities and cannot have the work done. Simply, the teeth have to ache and then they are pulled. It is a case of where life does not depend upon one tooth and they are willing to sacrifice many as long as they can get food. Clothes are not up to date; many are wearing discarded clothing from the armies, and they are not particular whether the trousers are from the

French and the coat from the German, as long as they are warm. I have seen some of the women wearing hobnailed shoes from the U. S. Army, coats from the Italian, hats from the German, coats from the British; but the greater the variety of clothing, the better they appear to like it."

L'Aide Confraternelle is an organization of French and Belgian dentists through which the League will operate.

Kindly look over your unused equipment and send a list of what you can spare, including materials also, to the office of the President of the League, 131 Allen Street, Buffalo, N. Y. Do not delay, but bear in mind that many instruments now idle and rusting may bring bread and life to our suffering brothers.

J. W. BEACH, *President.*

SUBSCRIPTIONS to the above fund to June 15, 1919, have been received as follows:

Connecticut State Dental Association	\$500.00
A. W. Crosby, New Haven, Conn.	25.00
F. T. Murlless, Jr., Hartford, Conn.	25.00
Rochester Study Club	11.00
W. D. Tracy, New York	500.00
W. J. Felch, Newcastle, Pa.	10.00
R. D. McCaskey	1.00
J. W. Beach, Buffalo, N. Y.	100.00
Indiana State Dental Society	100.00
Pennsylvania State Dental Society	500.00
Dental Society State of New York	500.00
Ambulance Fund	33.00
	\$2305.00

SOCIETY NOTES AND ANNOUNCEMENTS

NOTICES should reach the Office of the DENTAL COSMOS *not later* than the 11th or 12th of the month preceding that of publication.

Coming Dental Society Meetings.

With the National.

NATIONAL DENTAL ASSOCIATION. New Orleans. October 20th to 24th.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS. New Orleans. October 20th to 24th.

NATIONAL ASSOCIATION OF DENTAL FACULTIES. New Orleans. October 20th to 24th.

ASSOCIATION OF MILITARY DENTAL SURGEONS. New Orleans. October 20th to 24th.

DELTA SIGMA DELTA FRATERNITY. New Orleans. October 20th.

PSI OMEGA FRATERNITY, GRAND CHAPTER AND NATIONAL ALUMNI CHAPTER. New Orleans. October 20th to 24th.

XI PSI PHI FRATERNITY. New Orleans. October 20th to 24th.

State Meetings.

JULY.

NEW JERSEY STATE DENTAL SOCIETY. Atlantic City. July 16th to 18th.

PSI OMEGA FRATERNITY, OHIO ALUMNI CHAPTER. Cedar Point, Ohio. July 7th and 8th.

SOUTHERN CALIFORNIA DENTAL ASSOCIATION. Los Angeles. June 30th to July 2d.

National Mouth Hygiene Association.

DEPARTMENT OF EXTENSION LECTURES.

A COMPLETE lecture set, consisting of full manuscript and thirty-six specially selected and prepared lantern slides covering the subject of Mouth Hygiene is furnished by this association to members of state dental societies and others who may be considered as qualified to present the subject on the lecture platform.

EDWIN N. KENT,

Director of Extension Lectures,
330 Dartmouth st., Boston, Mass.

SEPTEMBER.

NEW ENGLAND DENTAL SOCIETY. Boston. September 3d to 5th.

TENNESSEE STATE DENTAL ASSOCIATION. Nashville. September 4th to 6th.

OCTOBER.

NORTHERN ILLINOIS DENTAL SOCIETY. Rockford. October 8th and 9th.

SUSQUEHANNA DENTAL ASSOCIATION OF PENNSYLVANIA. Scranton. October 8th to 10th.

Examiners' Meetings,

ARIZONA BOARD OF EXAMINERS. Phoenix. July 10th.

ARKANSAS BOARD OF EXAMINERS. Little Rock. July 3d to 5th.

CALIFORNIA BOARD OF EXAMINERS. Los Angeles, July 14th.

DELAWARE BOARD OF EXAMINERS. Wilmington. July 16th and 17th.

NORTH DAKOTA BOARD OF EXAMINERS. Fargo. July 8th.

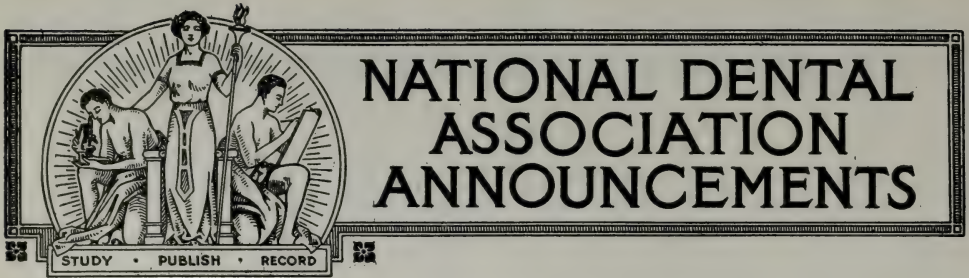
RHODE ISLAND BOARD OF REGISTRATION. Providence. July 1st to 3d.

Forsyth Dental Infirmary for Children.

NEW DEPARTMENT—LIBRARY AND MUSEUM.

THE trustees and director of the Forsyth Dental Infirmary for Children have authorized the creation of a new department, to be known as the "Library and Museum." They solicit from the dental profession contributions of books and dental periodicals, particularly those out of print and not readily obtainable by purchase; also casts or specimens that are of dental interest.

FREDERICK A. KEYES, D.M.D.,
Librarian and Curator of Museum.



Twenty-third Annual Meeting, held at New Orleans, October 20-24, 1919.

NEW ORLEANS.

IN accepting the honor of entertaining the National Dental Association on October 20-24, New Orleans feels that it can discharge the responsibility in a manner most satisfying to every delegate. This will be one of the most important gatherings of the year, and every effort will be put forth to impress upon the visitors that the famed hospitality of the South is yet a dominant factor in its life.

In New Orleans 1919 shakes hands with 1719 every day. One side of the city is a hustling, swarming American metropolis; the other side is a page from yesterday—a soul-stirring relic of bygone centuries; a glimpse far into the background of time; an old canvas daubed with the mellow colors of France, Spain, England, and America blended into a harmony of history.

Fabulously wealthy in authentic historical episodes, New Orleans offers to National dentists an opportunity to study a famous past which no other American city affords. The scenes of history, the buildings of history on the sites of history, are vital and living, preserved through two centuries for the eyes of 1919 to view as the eyes of 1719 viewed them.

What will you see in New Orleans?

This, my friend, and much more: Scene of the battle of New Orleans on Chalmette field; General Sir Edward Pakenham's headquarters, in which he died of wounds after the battle. Levee scenes where Farragut

steamed up the Mississippi to find millions in cotton and molasses ablaze along the levees.

The old Cabildo, whose stone-paved rooms Lafayette trod, under whose roof took place the formal transfer of the province of Louisiana from France to the United States. The ancient St. Louis Cathedral, where General Andrew Jackson bowed his head in the *Te Deum* that celebrated his victory in the battle of New Orleans. Jackson Square, where landed the exiled Acadians made immortal by Longfellow in "Evangeline." French Market, gathering-place of slaves and their mistresses in the dim, dark past. Old Absinthe House, built in 1798 and still a favorite resort. The house built for Napoleon, who was to be rescued by a Louisiana crew. The old French Opera, the first ever built in America. Jean Lafitte's blacksmith shop; and the "Archbishopric," the oldest original building west of the Alleghanias.

Nor are these all the historical settings in New Orleans. There are streets lovely with the lace-like arabesque of iron-work galleries made by Creole artisans. There are white-pillared houses with broad galleries of ancient times. There are parks that were plantations. There are restaurants and coffee-houses descending through five generations of chefs from father to son, with the old quaint customs.

And while old New Orleans, because of the charm of its ancient tradition and its romantic history, offers the visitor a rare op-

portunity for enjoyment, modern New Orleans none the less affords a big attraction.

Fourteen miles of steel and concrete, weather-protected docks facing the greatest inland harbor of the world; gigantic warehouses and grain elevators equipped with all the machinery which modern science has invented; a 32-foot deep navigable canal stretching out through the very heart of the city from the banks of the Mississippi to the shores of Lake Pontchartrain, providing water frontage for all manufacturing sites; great shipbuilding plants already at work, employing thousands of men on the banks of this canal; a wonderful climate, assuring twelve working months to each year; a perfectly drained and sewerred city with hundreds of miles of paved street, rat-proofed homes and yards—this is partially the story

of modern New Orleans, the New Orleans which the rest of this country knows so little about!

Its people have taken seriously the big tasks of a new day, and their dream is to make certain the prediction of a great man who recently visited us when he said: "The city is destined soon to become not only the second port, but in all probability the second city of America."

This is the half-told story of the old and the new New Orleans, the story which such a limited number of people know. It is the story of a great American city, "living, breathing, and growing greater every hour."

C. V. VIGNES, *President.*

J. P. WAHL,

Chairman Local Com.

Preliminary Announcement of the Program of the Meeting.

New Orleans, La., October 20-24, 1919.

IN THE SECTIONS.

Orthodontia and Periodontia.

TUESDAY, 2 P.M.

"An Analysis of the Various Principles of Orthodontic Treatment that have been Advocated during the Last Fifteen Years." By J. A. Cameron Hoggan, Richmond, Va.

"Necessity for Oral Prophylaxis and Radiology in the Practice of Orthodontia." By F. M. Casto, Cleveland, Ohio.

"Observations upon the More Recent Developments in Periodontology." By Arthur H. Merritt, New York, N. Y.

"Why the Field of Prophylaxis is Marked with a Lack of Enthusiasm." By Dorothea A. Howes, Washington, D. C.

WEDNESDAY, 9 A.M.

"Plurality in Etiology of Periodontoclasia." By John O. McCall, Buffalo, N. Y.

"What to Extract, and What Not to Extract, with Reference to Infections Involving the Periodontal Membrane." By Louis D. Coriell, Baltimore, Md.

"An Analysis of Case Characteristics with Reference to the Selection of the Most Efficient Form of Appliance for Treatment." By A. H. Ketcham, Denver, Colo.

"The Problem of Retention." By C. A. Hawley, Washington, D. C.

Operative Dentistry, Materia Medica, and Therapeutics.

FIRST SESSION.

"The Prevention of Chronic Mouth Infection." (Illustrated with stereopticon slides.) By Arthur D. Black, Chicago, Ill. Discussed by H. E. Friesell, Pittsburgh, Pa.; A. H. Hipple, Omaha, Neb.

[This paper will consider briefly the pathological changes which occur in cases of chronic alveolar abscess and chronic pericementitis, and will then discuss the causes and take up in detail the methods to be employed in operative dentistry for their prevention. Extensive studies of radiographs of root-fillings will be reported, and means of simplifying pulp treatment and root-canal technique will be presented. Particular stress will be laid

upon improvements in operative procedures to prevent peridental infection.]

"X-Ray in Dental Practice." By C. Edmund Kells, New Orleans, La. Discussed by H. B. Tileston, Louisville, Ky.; Howard R. Raper, Albuquerque, N. M.

SECOND SESSION.

"Some Recommendations for the Sterilization and Filling of Infected Roots." By Weston A. Price, Cleveland, O. Discussed by Clarence J. Grieves, Baltimore, Md.; Percy R. Howe, Boston, Mass.

"The Gold Inlay." By R. H. Volland, Iowa City, Iowa. Discussed by Wallace Wood, New Orleans, La.; W. L. Fickes, Pittsburgh, Pa.

Histology, Physiology, Pathology, Bacteriology, and Chemistry—Research.

FIRST SESSION.

"How Mouth Infection Affects the Kidneys." By Thomas B. Hartzell, Minneapolis, Minn.

"A Phase of Dental Caries." By Percy R. Howe, Boston, Mass.

"A Biochemical Study of Bacterial Metabolism in Its Relation to the Denser Tooth Structures." By Samuel E. Pond, Cleveland, Ohio.

SECOND SESSION.

"A Dental Histo-Pathological Study." By Harold Box, Toronto, Canada.

"Physiology and Pathology of Special Interest to Dentists." By J. J. Sarrazin, New Orleans, La.

"Studies of the Variations in Susceptibility to the (So-called) Rheumatic Group Lesions and to the Influence of Oral Focal Infections." By Weston A. Price, Cleveland, Ohio.

Prosthetic Dentistry and Crown and Bridge Work.

Special Announcement.

Owing to the fact that only two half-day sessions can be given to this section, it has been deemed best to dispense with long, exhaustive general papers and discussions, as more definite information can be given by selecting men to cover as many of the vital phases of this branch of dentistry as possible, with a view to standardizing technical pro-

cedure. The audience will thus individually have the opportunity of either accepting or rejecting the teachings of the essayists.

In addition to the papers and illustrations, the essayists will give individual clinics in order that those who desire to meet and discuss details further with the clinicians may have this opportunity.

FIRST SESSION.

PROSTHODONTIA.

"Scientific Interpretation of Muscular Control of Mandibular Movements." By Geo. H. Wilson, Cleveland, O.

[The dental profession and anatomists generally are not clear on this subject. Dr. Wilson has been doing research work along this line for some years, and is now ready to present his findings to the profession. Owing to the importance of this subject in its relation to denture construction we are fortunate to have it presented to us by a man of Dr. Wilson's ability and experience.]

"Surgical Interference for Preparation of Malformed Edentulous Mouths for Construction of Dentures." By James P. Ruyl, New York City.

[Demonstrates technique, using motion pictures for removing protruding gum tissue, irregular alveolar process, and other deformities in order to simplify complicated cases by providing a firm foundation upon which to build artificial dentures that will be more efficient and more beautiful.]

CROWN AND BRIDGE TECHNIQUE.

"Construction of Cast Clasps for Partial Dentures and General Consideration of Other Methods of Retention and Attachment of Vital Teeth for Removable Bridge Work." By Louis J. Weinstein, New York City.

[Mr. Weinstein's knowledge of the uses and abuses of metals used in dentistry, combined with his technical experience, enables him to present us with definite information on a subject of vital importance at this time.]

"Porcelain Jacket Crown Technique." By A. L. Legro, Detroit, Mich.

[Demonstrates a definite technique for making this most esthetic as well as most valuable prosthetic restoration for the conservation of the dental pulp comparatively simple.]

SECOND SESSION.

PROSTHODONTIA.

"Selection of Artificial Teeth for Prosthetic Restorations." By P. C. Lowery, Detroit, Mich.

[Clearly demonstrates one of the most important phases of dentistry which a large majority of dentists do not seem to appreciate as much as they should. The doctor shows that it is much simpler to harmonize tooth and face form than it is to adapt the face of your patients to your ideal tooth form.]

"Correction of Malocclusion in Artificial Dentures." By M. M. House, Indianapolis, Ind.

[Demonstrates with precision the highest type of efficiency in artificial dentures.]

CROWN AND BRIDGE TECHNIQUE.

"The Gold Shoulder Crown Technique." By Wm. H. Elliott, Detroit, Mich.

[This technique of the most widely used restoration in dentistry is definite, accurate, and simple.]

"Attachments for Vital Teeth in Fixed Bridge Work." By Forrest H. Orton, St. Paul, Minn.

[Dr. Orton's reputation as a technician and teacher of teachable techniques is so great that no dentist can afford to miss an opportunity to hear him lecture.]

"Mandibular Movements and the Forms of Artificial Bicuspid and Molars Necessitated Thereby." By Prof. Alfred Gysi, Zurich, Switzerland.

"Mandibular Control." By J. Leon Williams, New York City.

Oral Surgery, Exodontia, and Anesthesia,

FIRST SESSION.

Symposium on Apicoectomy.

1. "Apicoectomy: Its Indications and Contra-indications and Root-canal Technique." (Illustrated with stereopticon slides.) By Thomas B. Hartzell, Minneapolis, Minn.

2. "Surgical Technique of Apicoectomy." (Illustrated with stereopticon slides.) By Chalmers J. Lyons, Ann Arbor, Mich.

Discussed by Thomas P. Hinman, Atlanta, Ga.; William L. Shearer, Omaha, Nebr.; Carl

D. Lucas, Indianapolis, Ind.; Clarence J. Grieves, Baltimore, Md.; H. A. Maves, Minneapolis, Minn.

"Nitrous Oxid-Oxygen Anesthesia in Oral Surgery and Dentistry." By J. A. Heidbrink, Minneapolis, Minn. Discussed by Wm. H. Deford, Des Moines, Iowa.; John W. Seybold, Denver, Colo.; Boyd S. Gardner, Rochester, Minn.

"Tic douloureux; Etiology, Diagnosis, Treatment—Palliative, Blocking, and Surgical." By Rudolph Matas, M. D., New Orleans, La. Discussed by Herbert A. Potts, Chicago, Ill.

SECOND SESSION.

"Impacted Lower Third Molar." (Illustrated.) By Geo. B. Winter, St. Louis, Mo. Discussed by J. P. Henahan, Cleveland, O.; Harry W. Allen, Kansas City, Mo.; O. T. Dean, Seattle, Wash.; Roy S. Hopkinson, Milwaukee, Wis.

Symposium on Block Anesthesia.

"Preparation of Solution." By E. A. Litchfield, Humboldt, Nebr.

"Pharmacology of Various Local Anesthetics." By Samuel L. Silverman, Atlanta, Ga.

"Indications and Contra-Indications." By Fred F. Molt, Chicago, Ill.

"Technique of Blocking." (The most important injections.) By ———

"Suggestive Therapy and Treatment of Abnormal Conditions During and Following Injections." By P. G. Puterbaugh, Chicago, Ill.

"Diseases of the Antrum." (Illustrated with stereopticon slides.) By Chas H. Oakman, Detroit, Mich. Discussed by R. Boyd Bogle, Nashville, Tenn.; Truman W. Brophy, Chicago, Ill.

[AT NEW ORLEANS.]

Association of Military Dental Surgeons.

THE Association of Military Dental Surgeons of the United States will hold its annual meeting at New Orleans, October 20 to 24, 1919.

The officers of the association are—Capt. Edwin P. Tignor, president: Capt. George H. Cassaday, vice-president: R. W. Waddell, D.D.S., secretary and treasurer, 347 Fifth ave., New York City.

To Dental Surgeons of the American Expeditionary Forces.

NAMES WANTED FOR ORGANIZATION.

PLEASE forward at once full name, rank, and organization, and your home address, for the purpose of organizing and meeting with our national and state meetings.

Major R. F. ROWDYBUSH,
Walter Reed Hospital, Washington, D. C.

Psi Omega Fraternity.

OHIO ALUMNI CHAPTER.

A REUNION and convention of the Ohio Alumni Chapter of the Psi Omega Fraternity will be held at Cedar Point, Ohio, on July 7 and 8, 1919.

E. L. PETTIBONE, Cleveland, Ohio.

Southern California Dental Association.

THE Southern California Dental Association will hold its annual meeting on Monday, Tuesday, and Wednesday, June 30, July 1 and 2, 1919, at Hotel Trinity, Los Angeles.

The principal essayists will be Dr. F. E. Roach and Capt. John Sayer Marshall, U.S.A., M.D., Sc.D., F.A.C.S. A feature of the meeting will be a clinic competition, a cup being presented to the clinic team of the component society presenting the most valuable clinic.

JOHN R. MCCOY, *Editor*,
Los Angeles, Calif.

New Jersey State Dental Society.

THE forty-ninth annual convention of the New Jersey State Dental Society will be held on July 16, 17, and 18, 1919, on Young's Million Dollar Pier, Atlantic City, N. J.

The entire convention will be held on the pier. Machinery Hall will be used for the exhibits. Those who attended last year will remember the magnificent display of dental goods, and Dr. W. W. Hodges of Perth Amboy, N. J., chairman of the Exhibit Committee, with 25,000 square feet of space, has promised an exhibit greater than that of 1918. Dr. Angelo Zabriskie of Ridgewood, N. J., as chairman of the Clinic Committee, has arranged for a program of clinics that will prove of great interest.

The Essay Committee under the direction

of Dr. Edward L. Wharton of Newark will present essayists of prominence—names and subjects to be announced.

All meetings for the presentation of papers as well as the business meetings will be held in the Greek Temple, out on the pier.

The headquarters of the society will be at the pier entrance. Mail may be directed to exhibitors, clinicians, or members, in care of the Secretary New Jersey State Dental Society, Young's Million Dollar Pier.

A list of hotels where special rates may be secured will be published in the *New Jersey Dental Journal* prior to the convention, or may be secured by addressing the secretary.

A cordial invitation is extended to ethical practitioners.

JOHN C. FORSYTH, *Sec'y*,
430 E. State st., Trenton, N. J.

New England Dental Society.

THE New England Dental Society, formerly the Northeastern Dental Association, will hold its twenty-fifth annual meeting in Boston, Mass., on September 3, 4, and 5, 1919, at the Somerset Hotel, Boston, Mass.

ALVIN A. HUNT, *Sec'y*,
Hartford, Conn.

Tennessee State Dental Association.

THE fifty-second annual meeting of the Tennessee State Dental Association will be held at the Hotel Hermitage, Nashville, September 4, 5, and 6, 1919.

From all appearances our program promises the greatest meeting ever.

JAS. J. VAUGHN, *Ch. Publicity Com.*
Nashville, Tenn.

Susquehanna Dental Association of Pennsylvania.

THE fifty-fifth annual meeting of the Susquehanna Dental Association will be held at Hotel Casey, Scranton, Pa., October 8, 9, and 10, 1919.

As the members of the association all remember, this meeting was to have been held at the same time and place last fall, but on account of the influenza epidemic it had to be canceled, and it was arranged to be held in October so as not to interfere in any way

with the attendance at the April meeting of the State Dental Society at Pittsburgh.

The executive committee are working out plans to make this the best meeting in the history of the association. It is going to be one of those good old-fashioned meetings that no one can afford to miss.

Further details will follow, but we give you this friendly little tip now—that it is going to be somewhat along the postgraduate line, some of the biggest men in the profession having already been retained for the three days.

Watch for further details and begin to plan to lock up your office for the whole session. We will make it well worth the trip.

J. P. COULT,
E. L. BROWN,
J. B. TWEDDLE,
Committee.

Northern Illinois Dental Society.

THE thirty-second annual meeting of the Northern Illinois Dental Society will be held at Rockford, Ill., on Wednesday and Thursday, October 8 and 9, 1919.

A cordial invitation is extended to ethical practitioners of dentistry.

R. P. CULVER, *Sec'y*,
DeKalb, Ill.

California Board of Examiners.

THE next meeting of the Board of Dental Examiners of California for the purpose of examining applicants for a license to practice dentistry in that state will be held in the city of Los Angeles, beginning on the 14th day of July, 1919, at 9.30 A.M. Each applicant shall file with the secretary of the board at least ten days before the date selected for each examination, the following credentials: (1) Diploma or certificate of graduation from a reputable dental college approved by the board. (2) A diploma from an accredited high school or a certificate signed by a state superintendent of public instruction (or similar officer) to the effect that the applicant has had scholastic preparation equivalent in all respects to that demanded for graduation from a high school giving a four-year course of instruction. An applicant who has been a licensed practi-

tioner of dentistry of some other state of the United States for a period of at least five years shall file such license or licenses, which will be accepted in lieu of high-school credentials. (3) Testimonial of good moral character. (4) A recent unmounted photograph of the applicant.

For further information, address

C. A. HERRICK, *Sec'y*,
133 Geary st., San Francisco, Cal.

North Dakota Board of Examiners.

THE next meeting of the North Dakota State Board of Dental Examiners will be held at Fargo, beginning July 8th.

For application blanks and further information address
W. E. HOCKING, *Sec'y*,
Devils Lake, N. D.

Delaware Board of Examiners.

THE Delaware Board of Dental Examiners will meet for the examination of candidates for certificates on July 16 and 17, 1919, in Wilmington, at the Municipal building at 9 A.M. Fee for examination \$25.

W. S. P. COMBS, *Sec'y*,
Middletown, Del.

Arkansas Board of Examiners.

THE Arkansas State Board of Dental Examiners will hold their examinations at Hotel Marion, Little Rock, Ark., July 3, 4, and 5, 1919. All applications must be in the hands of the secretary on or before June 23d. Examination fee \$15. For further information and application blanks address

H. J. GREEN, *Sec'y*,
Paragould, Ark.

Rhode Island Board of Registration.

THE regular semi-annual meeting of the Rhode Island Board of Registration in Dentistry for the examination of applicants will be held in the State-house, Providence, R. I., July 1, 2, and 3, 1919. All applications with proper fee must be filed one week previous. For further information address

ERNEST A. CHARBONNEL, *Sec'y*,
334 Westminster st., Providence, R. I.

Arizona Board of Examiners.

THERE will be a meeting of the Arizona Board of Dental Examiners at Phoenix, Ariz., beginning July 10, 1919, to examine candidates for a license to practice dentistry in Arizona, and to transact such other business as may properly come before the board.

Application blanks may be secured from the secretary of state, Phoenix, Ariz.

W. P. SIMS, *Sec'y*,
Box 58, Bisbee, Ariz.

New York State Examinations in Dentistry.

POSTPONEMENT BY THE BOARD OF REGENTS.

BECAUSE of the interference with the course of instruction, caused by the emergent inauguration of the Students Army Training-corps in connection with dental schools,

it has been found that in many cases it is necessary to extend the course of instruction in the schools for the current senior year, to a period beyond the regular date of graduation, many of the schools being obliged to lengthen the course to July 15th and some to a date as late as July 31st.

To the end that there may be no hardship to students thus graduating after the date of our regular June dental examination, it has been formally decided by the Board of Regents to postpone the June dental examination until the first Tuesday of September, and the September examination until the second Tuesday of November.

There was therefore no June dental examination held in this state in 1919, but this will not affect examinations in subsequent years.

AUGUSTUS S. DOWNING,
Assist. Commissioner of Education.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING APRIL 1919.

April 1.

- No. 1,298,673, to CARLO DE FELICE. Dental plate.
- No. 1,299,067, to CHESTER J. UNDERWOOD. Dental bridge work.
- No. 1,299,102, to EDWARD H. ANGLE. Orthodontic implement.
- No. 1,299,103, to EDWARD H. ANGLE. Orthodontic implement.
- No. 1,299,137, to CHARLES H. DAVIS. Dental tool.
- No. 1,299,364, to CHARLES W. LOKEY. Fastening for removable dental bridges and bridge plates.

April 15.

- No. 1,300,495, to JOSEPH H. SHANK. Dental tool.
- No. 1,300,868, to PIEPER and PIEPER. Dental cuspidor fixture.
- No. 1,300,937, to WILLIAM S. EDWARDS. Tooth.

April 22.

- No. 1,301,181, to WILLIAM F. SHAW. Artificial tooth attachment.
- No. 125,185, to ALVOREA CHEMICAL Co. Trade-mark for dentifrice and alkaloïds in solution for treating and preventing pyorrhea, absorption of tissues and glands.
- No. 125,187, to Barclay & Co. Trade-mark for dentifrice.
- No. 125,208, to JAMES H. DOWNIE. Trade-mark for impression wax for dental use.
- No. 125,212, to WILLIAM T. ELZINGA. Trade-mark for dental-floss holders.
- No. 125,226, to HENRY D. JUSTI. Trade-mark for artificial teeth and dental articulators.

April 29.

- No. 1,303,133, to ALBERT C. CLARK. Anesthetic apparatus.
- No. 1,302,152, to GEORGE GOLDFOOT. Artificial tooth.



DR. HARRY STEWART HASLETT.

THE DENTAL COSMOS

VOL. LXI.

AUGUST 1919.

No. 8

ORIGINAL COMMUNICATIONS

A Consideration of Some Lesions of the Oral Cavity from the Viewpoint of Their Relationship to Systemic Infection,

AND THE

Technique for the Administration of Conduction Anesthesia for Their Surgical Removal.

By M. HILLEL FELDMAN, D.D.S., New York, N. Y.

CHIEF OF THE DENTAL DEPARTMENT OF LINCOLN HOSPITAL.

(Read before the Academy of Pathological Science, New York City, April 25, 1919.)

WHILE the discovery of a relationship between ill health and dental defects dates back, perhaps, for centuries, it has remained for practitioners of medicine and dentistry during the past decade to give it the wide prominence which it deserves.

There seems to be ground for believing that in the earlier years of medical study the ill effects upon the general economy from defective teeth were directly attributable to simple caries of the teeth, the theory being that the ingestion of putrid infectious material with the food bolus into the stomach produced infection. It would be idle to argue that the ingestion of pus and the swal-

lowing of poorly masticated food would not react upon the individual's digestive apparatus to his utter disadvantage. But it does not appeal to our modern sense of pathology as being responsible for or more than remotely related to the many systemic ills for which the teeth are today being held responsible. It is common knowledge that the mucous membrane of the gastro-intestinal tract when in health can tolerate much abuse, and usually can dispose of septic food when swallowed. We must look elsewhere than in the carious crown portion of a tooth for the serious systemic ill effects of what we term oral sepsis.

Similarly, pyorrhea, or more properly

termed, chronic suppurative gingivitis, is of less pathologic significance in the etiology of disease in remotely situated organs and tissue than alveolar abscesses, because pyorrhetic teeth drain into the oral cavity, while many teeth with alveolar abscesses do not drain, the seat of infection being surrounded by a dense bony wall, necessitating the drainage of septic material directly into the blood channels.

Furthermore, sepsis located at the root-ends of teeth would naturally seem to be more insidious than pyorrhea, because the onset of the latter is commonly accompanied by symptoms apparent to both patient and dentist, while apical abscesses usually do not give rise to any actively disturbing symptoms which would lead either patient or dentist to suspect their presence. It is a sad fact that these dental abscesses arise and continue for years to drain their insidious toxins into the lymph and blood channels of the circulatory system without giving the least sign of their existence. Thus we see how important a rôle the X-ray has played in the discovery of these hidden blind abscesses at the ends of teeth the pulp contents of which have been removed from their dental canals. (Fig. 4.)

The writer is usually very conservative in his surgery, but in viewing the problem of pulpless teeth he cannot but take the stand that chronically infected teeth with septic subapical areas, in the main should be extracted and their alveoli thoroughly curetted. The dental profession is not united upon the principles and practice of root-canal therapy, and, this being the fact, until that day arrives it is our duty to accept the teachings of scientific investigators, as Rose now, Billings, Hartzell, and others, that pulpless teeth are a menace to the human system and should be extracted. True, countless thousands enjoy the blessings of health in spite of the presence in their mouths of septic teeth; but is not this a matter of immunity? Some there are who possess sufficient antibodies to render innocuous the invading dental organism, but we know there are

many who cannot fight off the toxic processes, and it behooves the profession to take cognizance of the fact that they are gambling with the patient's life when they cause to be retained in the mouth septic teeth which may at any moment overcome the immunization hitherto enjoyed by the patient.

It is a known fact, borne out by numerous cases on record, that a certain tooth, with pulp contents removed and canal filled, may go along for a long period without giving a patient the least disturbing symptom, and then suddenly break out in acute violence. And what, pray, has happened? The immunity hitherto enjoyed by the individual has succumbed, as it were, to the constant attacks of invading micro-organisms at the apices of the roots. Your essayist yields to none in his high regard for the sacredness of the dental organ, but he holds far more sacred the ultimate effect on bodily health of the retention, at great possible sacrifice, of a pulpless chronically infected tooth branded "cured" by the therapy in vogue today. There is such a thing as yielding to the inevitable, and the extraction of such infected teeth becomes our inevitable duty.

The day of Prevention, when it dawns upon the dental profession, will see the end of chronically septic teeth and solve the problem of the relationship between oral lesions and systemic ailments. That destiny is vouchsafed the profession by Dr. Mayo of Rochester, Minnesota, who said a short time ago: "The next great step in preventive medicine will come from the dental profession;—will they take it?" This is both a challenge and a prophecy, for your essayist believes that the next generation will find itself vastly improved over the present in the matter of dental efficiency.

Coming back to a consideration of oral lesions in particular, we are confronted with two conditions which bear upon systemic ills by the fact that they directly and indirectly infect the tissues of the body. These are pyorrhea, or chronic suppurative gingivitis, and alveolar abscesses.

Briefly considered, pyorrhea is brought

FIG. 1.



Case of maxillary sinusitis evidently caused by the accidental introduction of a root fragment in extraction.

FIG. 2.



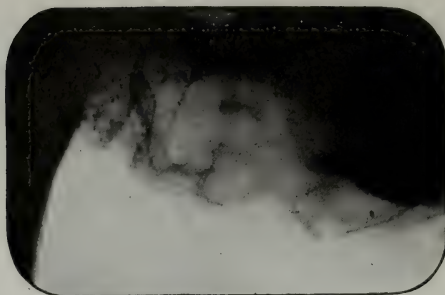
Case of a radicular cyst which had destroyed the nasal wall of the maxillary sinus.

about by—(1) Micro-organisms of the streptococcus group, the pneumococcus group, the staphylococcus group, amœbæ, spirochaetae, putrefactive organisms, etc. (2) Chronic trauma, produced by tartar, caries, malocclusion of the teeth and jaws, defective artificial dental restorations, and often by improper use of cleansing agents, toothbrushes, picks, etc. (3) Constitutional conditions which

make the tissues more susceptible to infection by lowering their resistance—diabetes, pregnancy, lactation, lead poisoning, mercurialism produced in therapy, alcoholism, blood diseases, anemia, infected tonsils, infected nasal sinuses, etc.

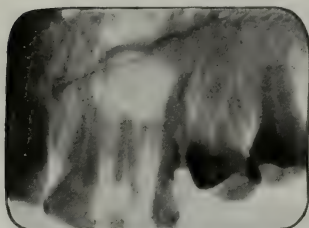
Alveolar abscesses arise through infection of the alveolar process from the root-canals of teeth with infected pulps.

FIG. 3.



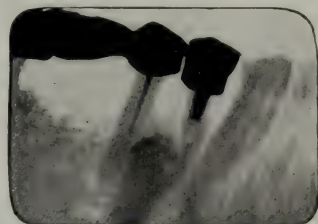
Case of necrosis of the maxilla involving the maxillary sinus following extraction of a tooth.

FIG. 4.



Case of a radicular cyst in the mouth of a patient affected with severe joint involvement for many years.

FIG. 5.



Case of severe neuralgia caused not by the crowned teeth but by an unerupted bicuspid in the mandible.

A. D. Black reports finding alveolar abscesses at the roots of 47 per cent. of devitalized teeth. Other investigators have found an even higher percentage, one as high as 80 per cent. of all devitalized teeth, showing areas of bone absorption around the apices disclosed by the roentgenogram.

The mode of onset of an apical infection varies. Generally speaking, it is rather slow in developing, causing no symptoms which might cause suspicion of the tooth by patient or dentist. Often, however, apical infection will appear soon after the filling of a root-canal, with the production of pus and destruction of bone tissue, giving rise to symptoms akin to those of an acute infection and sometimes becoming so extensive as to involve the maxilla or mandible in a positive osteomyelitis.

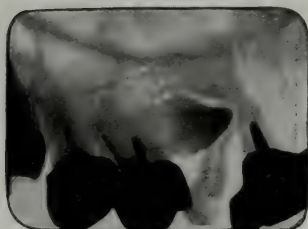
The presence of alveolar abscesses of the chronic variety is usually discovered only by means of the roentgenogram. There seems to be a difference of opinion

among dental practitioners as to the meaning of shadows at the root-ends of teeth, some believing that shadows represent pathological conditions only when accompanied by pain or other clinical manifestation to corroborate the roentgen findings. This makes it imperative, from the standpoint of the patient's welfare, to have the teeth clinically and roentgenographically examined by an oral surgeon, who, taking all elements into consideration, is alone qualified to render an intelligent and satisfactory diagnosis of dental pathologic conditions. (Fig. 11.)

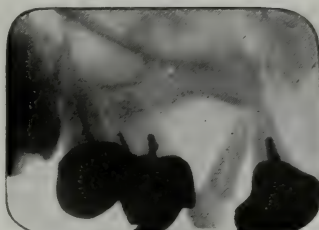
METASTATIC INFECTION.

It would be folly for us to assume that all foci of infection in the mouth necessarily produce metastatic infection through the medium of the blood and lymph. We know that animal organisms gain an immunity against chronic infections and under normal conditions keep the infections localized.

FIG. 6.



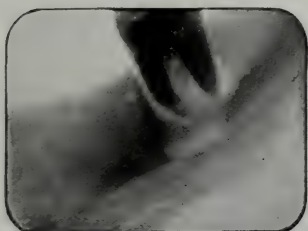
A



B

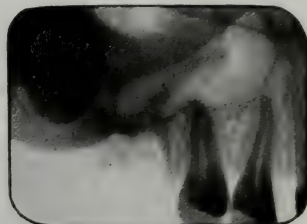
Case showing the removal of an impaction without disturbing the naturally placed teeth in the arch.

FIG. 7.



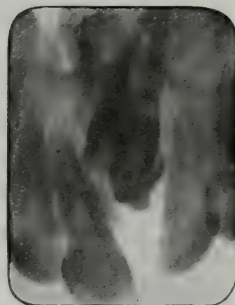
Case of arsenical necrosis involving the mandible as far down as the inferior dental canal.

FIG. 8.



Case of a portion of the root of a molar forced up into the antrum in extraction.

FIG. 9.



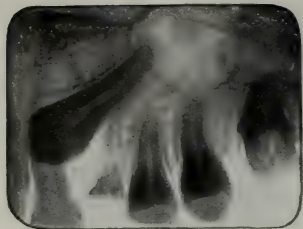
Unrupted central incisor impeded by the presence of a supernumerary central.

It is in periods of general debility, produced by fatigue, exposure, digestive disturbances, pregnancy and lactation, diabetes, anemia, etc., that the blood succumbs to the invasion of the micro-organisms produced by dental disturbances and deposits toxic products in distant organs and tissues. Pasteur has shown in experiments on chickens that while the latter are naturally immune to anthrax, they become susceptible to the disease if the body temperature is reduced by a cold bath. This, gentlemen, is the answer to the oft-repeated question: "If dental infections are so insidious, and exist in so many mouths, why do not all people who have chronic apical disturbances suffer the concomitant ills of septicemia?" We must not forget that the natural defensive mechanism of the organism plays an important, aye, an all-important rôle in the process, and that so long as the resistance of the body is good the infections remain localized. Logically,

then, when non-vital teeth are discovered, the object of the treatment should be, either the absolute elimination of the pathological condition by conservative treatment with root-canal therapy, if that is possible, or the thorough removal of teeth and investing membrane and tissue with surgical curets.

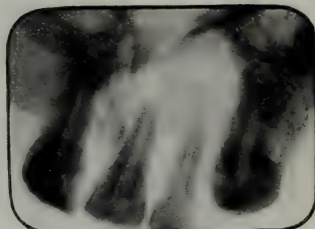
It is well to record the fact that pathological changes following metastatic

FIG. 10.



Case of an impacted canine being the cause of severe neuralgia—apex projecting into the antrum.

FIG. 11.



Illustrating the discovery of alveolar abscess with the radiograph; teeth showing apparently normal, with no coronal cavities.

FIG. 12.



Radiograph taken six weeks after operation for cystectomy, showing the early stage of regeneration.

infection from oral foci are often extreme in their process, and hence we find an explanation for the continuation of the secondary condition long after the elimination of the primary focus—sometimes even so violent that death has resulted in spite of the eradication of the dental pathological condition. Welch has put forth the theory that organisms in their struggle for existence in the tissue of an individual may acquire the faculty of protecting themselves against his defensive mechanism. In such cases it seems as if the continuation of systemic symptoms enduring after dental foci have been removed would indicate the use of autogenous vaccine therapy.

But, as already stated, even this treatment may be too late to save the patient.

Perhaps a more prevalent condition than is generally believed is the relationship of dental foci of infection to headache. These pains in the head are reflected from the cervical vertebrae upward, or through the maxillary sinus by the rupture of an alveolar abscess into the sinus. It has been the experience of your essayist to cause a suspension of headache pains as soon as the novocain conduction injection has been made. It is interesting to note that a very severe headache may be caused by a tooth not necessarily abscessed, and there are instances where a portion of the

pulp of a tooth has become calcified, known as pulp stone, causing intensely acute reflexes. Only the most careful examination by a dentist will discover such an obscure condition.

CASE REPORTS.

CASE 1. Patient, male, a physician, had been a chronic sufferer from headaches for a period lasting many years, and had received no relief from treatment for post-nasal catarrh. The X-ray disclosed an infected upper right second bicuspid. Extraction with drainage and curetment of the sinus for a condition which the writer diagnosed as hydrops antri has given the patient relief from all trouble, and he has had scarcely a suggestion of the headaches and general lack of energy which prevailed before the operation.

CASE 2. Patient, male, age thirty-six, had been referred to the writer's clinic as a sufferer from chronic osteomyelitis extending over a period of twenty years, characterized by metastatic abscesses. At the time of his visit to the clinic above referred to he had already had one leg amputated to the hip joint. The right leg was beginning to give him severe pains and was actually discharging pus in the region above the ankle. He was also suffering pains in the face, and for this reason he was sent to have his teeth examined. An X-ray of the lower incisal region disclosed a necrotic condition in spite of apparently vital teeth. Extraction and curetment produced remarkable results. The patient began to feel improvement in his general condition. Encouraged by this result, your essayist discovered a number of apparently vital teeth, teeth with normal color and no suggestion of caries, nevertheless responding negatively to the electrical vitality test. Within a very short time the patient's teeth were all extracted and the sub-dental areas curetted. Two years have now passed; the patient is enjoying perfect health for the first time in twenty years, has had no abscesses anywhere in his body since his teeth were extracted, has seen his right leg heal completely, and has not had to take so much as a headache remedy for two years, whereas prior to his visit to the dental clinic at Lincoln Hospital he scarcely experienced a day's comfort in complete absence of pain.

CASE 3. Patient, male, a dentist, had been a sufferer from stomach disturbances for several years, and had found little comfort in medical treatment. Finally a diagnosis of duodenal ulcer was made and the patient ad-

vised to undergo an operation. He demurred and delayed. Suddenly his teeth began to pain him, and he had them radiographed. A lower molar and an upper molar were found non-vital, with subapical areas of alveolar destruction. These teeth were extracted. From the very moment the teeth were removed the patient's stomach seemed to recover completely, and to this day, some three years after, he has not experienced a recurrence of the intestinal trouble for which the surgeons were about to operate.

CASE 4. Patient, female, age thirty-six, was suffering from obstruction of the gall-bladder. Among the symptoms she experienced was a strange weakness in the right hand which did not permit of her turning a door-knob without feeling intense pain. She would be awakened in her sleep if she accidentally turned on her hand. Before being operated upon for gall-stones she was advised by her surgeon to have any possible oral foci removed. Dental radiographs disclosed nine areas of apical granulomas; these were promptly curetted. The pains in the hand materially lessened without resort to vaccines, but of course it did not abort the operation for gall-stones. She subsequently underwent the major operation, and is today enjoying comparatively perfect health. There is still a weakness, though not very marked, in the wrist. Probably vaccine therapy might have eliminated even these slight pains, but her physician had advised against the use of vaccine.

Your essayist has advanced two possible theories in this case; one is the possibility that the reduced resistance brought on by the gall-bladder disturbance might have subjected the teeth to infectious processes, and the second is the possible infection of the gall-bladder by the dental foci, the bacterial toxins evincing a special selective affinity for special tissues according to the theories of Rosenow.

CASE 5. Patient, female, age thirty, had been experiencing failing vision of the left eye for months, and received no permanent relief from local therapy of the eye. She was referred for dental examination, and radiographs as well as clinical examination disclosed that the left maxillary teeth were all diseased as well as the left maxillary sinus. Extraction of the teeth and drainage of the sockets and sinus improved the eyesight within one month.

CASE 6. Patient, male, age twenty-seven, had suffered neuralgic pains in the left side of the face for several weeks, and when referred to your essayist his eyelids were closed and erythematous. Radiographs taken of the face unearthed an impacted upper third molar. Extraction of the tooth seemed to give instant relief from the pains, and within a week the eye was normal.

Your essayist could go on with numberless recitals of cases from practice both private and hospital, but has chosen a few typical cases to demonstrate how serious may be the relationship of dental foci to distantly placed organs and tissues.

Now for a few remarks on the subject of

CONDUCTION ANESTHESIA.

Nerve-blocking, or conduction anesthesia, is peculiarly well adapted for use in the oral cavity. The areas of the maxillæ supplied with sensation by the trigeminal nerve present easy access to

the operator, and the technique, when mastered, is quite simple. The landmarks for injection are—(1) The infra-orbital foramen for the incisor teeth in the maxilla. (2) The tuberosity of the maxilla for the bicuspid and molars. (3) The mandibular foramen for the mandible. (4) The mental foramen for the lower incisors. (5) The naso-palatine and posterior palatine foramina in the maxilla for the palatal tissues. The drug used is novocain-suprarenin, and the medium of solution is either saline or Ringer's solution—prepared tablets containing calcium salts.

[The technique of producing anesthesia was elaborated by stereopticon demonstration.]

In conclusion, just a word to say that there will be fewer chronic diseases when the laity, the physicians, and the dentists recognize the full importance of oral prophylaxis and the thorough removal of all oral foci.

616 MADISON AVE.

Diseases of the Dental Pulp.

IV. Treatment.

(Continued.)

By HERMANN PRINZ, M.D., D.D.S., Philadelphia, Pa.

(Continued from page 648.)

4. Acute Purulent Pulpitis.

Acute purulent pulpitis is an acute suppurative (destructive) inflammation of the exposed pulp accompanied by the formation of abscesses or a phlegmon.

ETIOLOGY.

In the greatest majority of cases it is brought about by an infection from organisms connected with the carious process, *i.e.* a streptomycosis, although

secondary infection from a chronic suppurative pericementitis or hematogenous causes is occasionally observed. Purulent pulpitis is usually restricted to filled teeth, *i.e.* teeth in which at the time of placing the filling a minute break in the continuity of the pulpal wall has been overlooked.

Clinically, only one variety is known. It manifests itself primarily as an acute type, although a subacute, chronic, or purulo-gangrenous form is occasionally

observed. The line of demarcation between these various grades is too hazy to be determined clinically.

CLINICAL PATHOLOGY.

The clinical picture of a case of purulent pulpitis is always typical. The patient suffers excruciating, intolerable pain; in fact, the pain is so intense that it may be classified with the severest forms of suffering to which human flesh is heir. The pain is not localized and is of a diffuse boring and throbbing character. The affected tooth cannot be pointed out by the patient, and it may even be impossible for him to designate the jaw in which it is located. In the last stages of severe cases general symptoms such as chills and fever, marked weakness due to loss of sleep, to suffering, etc., accompany the local manifestations.

PATHOLOGY.

Pathologically, purulent pulpitis typifies a circumscribed suppuration of the pulp, *i.e.* an abscess, which may be single or multiple. The circulation is much obstructed, since the infected pulp has lost all power of defense; the progressive obstruction finally results in a circumscribed stasis or death of the necrobiotic portion of the pulp. The vessel walls break down; polynuclear leucocytes, and, to a less extent, red corpuscles, are attracted toward certain bacteria in enormous quantities and thereby become the progenitors of pus corpuscles. A circumscribed collection of this freshly formed pus is designated as an abscess. In its early stages the abscess is usually confined to a horn of the pulp and is located directly opposite the point of entry of the infection, namely, the minute opening in the pulpal wall. Above the abscess a wall of inflamed tissue denotes the line of demarcation, and the remaining pulp presents the typical picture of a severe type of acute inflammation. With the progressive advance of necrobiosis, the final submission of the whole pulp to the infection is only a question of time. It should be observed that the

process of destruction is in most cases intensely acute. The nerve fibers preserve their integrity to the very end of the struggle. As the pulp is confined within an unyielding wall of dentin, the increasing pus produces compression of these fibers, and hence the persistent, intolerable pain.

If the formed pus does not remain localized, but infiltrates into the spaces between the connective tissue cells, a phlegmonous suppuration of the entire pulp results which quickly kills it. Through the agencies of specific proteolytic ferments the necrosed tissue changes to gangrene. In multi-rooted teeth, especially the molars, this purulo-gangrenous type of pulpitis is most frequently observed. In such cases one root-canal may be found to be totally gangrenous, while another canal contains a pulp remnant in an advanced state of severe acute inflammation.

SUBJECTIVE SYMPTOMS.

There is a very violent, throbbing, continuous pain, increasing on entering a warm room, on lying down, or on the application of heat. Cold applied to the tooth does not seem to affect it very much. Slowly increasing, persistent pain has been present for many hours or even days.

DIAGNOSIS.

On inspection of the oral cavity, one should always be suspicious of a filled tooth as being the one involved. Its color is usually not altered. Transillumination may furnish a diffused shadow picture of the coronal portion of the pulp. On applying heat a marked increase of pain is felt. This symptom is typically pathognomonic of acute purulent pulpitis. Percussion, especially in the later stages, indicates a slight involvement of the peridental membrane; there is no swelling of the gum tissue. Roentgenogram usually negative. The resistance of the electric current is materially lessened, *i.e.* the amount of current necessary to bring about a response is much higher than that which is required to establish

the normal irritation point of the patient. The pulp is not exposed.

DIFFERENTIAL DIAGNOSIS.

The intensity and duration of the pain and its increase on applying heat or by any other means which raises the blood pressure differentiates purulent pulpitis from other types.

PROGNOSIS.

Resolution of a pulp affected with purulent pulpitis is not to be expected; its removal is indicated. The subsequent treatment of the root-canal, etc., usually restores the tooth to its normal functions.

TREATMENT.

On penetrating into a pulp chamber containing a purulent pulp, with a bur, practically no pain is experienced; occasionally, however, a very short paroxysm may be observed. On withdrawing the bur, the pent-up pus wells up, followed by a drop or two of dark blood.

The violent pain which the patient has suffered for hours or days ceases almost instantly. The pulp chamber is opened as widely as possible and washed out with warm water. A broach may now be inserted to ascertain whether the whole or only part of the pulp has succumbed to the infection. In the former case, immediate extirpation of the necrotic pulp débris is indicated. A dressing of dichloramin-T is sealed into the empty root-canal and the patient is dismissed with the general directions given below. The subsequent treatment of such root-canals is discussed under "Necrosis and gangrene." If, however, a part of the pulp is still alive, an effort is made to gently remove the necrotic portion until the line of demarcation is reached. Copious washing with warm water will, by depletion, materially assist in quieting the intensely congested pulp stump. This antiphlogistic measure will be gratefully appreciated by the patient. A sedative antiseptic is now sealed into the dried pulp chamber for from twenty-

four to forty-eight hours. A most suitable compound for such purposes consists of a saturated solution of chloretone in oil of cloves or a 20 per cent. solution of novocain in camphorated phenol.

No effort should be made at this time to extirpate the pulp stump under pressure anesthesia. Violent pain will always follow an attempt at anesthetizing an inflamed tissue by direct contact. Even conduction anesthesia in such cases is rarely followed by its customary success. To apply arsenic upon an inflamed pulp indicates utter disregard of the fundamental principles of pharmacotherapy; intolerable pain is always the sequence of such a procedure. On return of the patient the now quiescent pulp stump will usually allow its extirpation under some form of local anesthesia or arsenic application as discussed under "Devitalization of the pulp."

The general condition of a patient suffering with purulent pulpitis demands some attention. Light nutritious food is advised, and the patient instructed to go to bed as soon as possible in order to refresh himself with a long and much-needed sleep. Before retiring, as a prophylactic, 10 grains (0.6 gm.) of acetylsalicylic acid (aspirin) are taken with a glass of water or a cup of warm tea. A saline purge given the following morning is, in most cases, indicated.

5. Chronic Ulcerative Pulpitis.

This is a chronic ulcerative (productive) inflammation of the exposed pulp.

ETIOLOGY.

The causes of chronic ulcerative pulpitis are practically always to be sought for in a mixed streptococcus invasion arising from the carious process through a large break in the pulpal wall. Only one variety is known.

CLINICAL PATHOLOGY.

The clinical picture of this disease is somewhat hazy; only mild, and frequently no subjective manifestations are

observed. The affected tooth has a large cavity or a badly leaking filling which allows free drainage from its open pulp chamber. Occasionally a patient complains of a disagreeable sensation in the tooth, although real pain is rarely felt except when pressure from food débris crowded into the cavity produces a paroxysm which may last for some minutes, or until the pressure is relieved. No swelling of the surrounding tissues is observed.

PATHOLOGY.

The exposed pulp presents a moist grayish-white necrobiotic surface, *i.e.* a suppurating ulcer. Below the débris a wall of dense granulation tissue is felt which separates the necrotic tissue from the underlying chronically inflamed pulp. In the struggle for existence against the constant irritation brought about simultaneously by the infection and the pressure from food crowded into the open pulp chamber, the pulp responds gallantly with all its forces of defense, which results in the above-referred-to line of demarcation and in the deposition of adventitious dentin and pulp nodules within its own tissue. These nodules grow concentrically by the deposition of calcium salts upon a nucleus, and may assume a size so as to completely fill the pulp chamber. The process of destruction of the remaining pulp is very slow. Depending upon the original vitality of the pulp, it may require many months for its completion.

SUBJECTIVE SYMPTOMS.

The patient complains of very little discomfort; when food is crowded into the cavity, pain from pressure results which is relieved by its removal. Only in very advanced cases are secondary manifestations observed.

DIAGNOSIS.

Chronic ulcerative pulpitis may be accidentally discovered by inspecting the teeth. On excavating the cavity a large break in the pulpal wall is revealed: the pulp chamber is filled with necrobiotic

tissue, and on inserting an explorer into the inflamed portion of the pulp severe pain is manifested. The application of cold produces pain, indicating inflammation, while percussion is negative. The roentgenogram may show pulp nodules. The response to the electric current is usually the same as that observed in purulent pulpitis, namely, a greater amount of current is necessary than normally.

As to *differential diagnosis*, an open pulp chamber and freedom from pain are the principal pathognomonic signs of chronic ulcerative pulpitis and differentiate this disease from other types.

PROGNOSIS.

A chronically inflamed pulp with an ulcerating surface does not offer favorable conditions for pulp preservation; its removal and subsequent treatment of the root-canal restores the tooth to normal function.

The *treatment* of chronic ulcerative pulpitis calls for the same routine procedures as previously described under "Acute purulent pulpitis."

6. Chronic Hyperplastic Pulpitis.

Chronic hyperplastic pulpitis is a chronic productive inflammation of the exposed pulp characterized by a slowly growing granulation tissue upon its surface, filling, more or less, the carious cavity and sometimes protruding therefrom.

ETIOLOGY.

It is caused by a chronic irritation of the pulp by the rough edges of the broken wall of the pulp chamber. A large opening into the chamber seems to be essential. The fungoid growth may be looked upon as an endeavor instituted by the irritated pulp to protect itself.

One variety only is observed; it may occur as a simple small overgrowth of the irritated pulp tissue, or as a vascular mass filling the entire cavity or even protruding therefrom. A parenchymatous variety occurring in a closed pulp chamber is clinically not recognizable.

CLINICAL PATHOLOGY.

The clinical picture of a chronic hyperplastic pulpitis, commonly referred to as pulp polypus, is very typical. Within the cavity of the tooth a deep red polypus, ranging in size from that of a pin-head to a large pea and often protruding from the cavity, may be seen. In fractured teeth a fungoid growth of the exposed pulp is occasionally observed. On touching the growth with the finger, pulsation is felt; the patient does not complain of real pain. A slight wound in its surface causes a profuse hemorrhage.

PATHOLOGY.

Pathologically this new growth is a typical hypertrophy and consists of slowly growing granulation tissue endowed with a very rich blood supply and an excess of nerve fibers. Correctly speaking, it is not a neoplasm (tumor). The odontoblasts disappear and the endings of the nerve fibers degenerate, hence the polypus does not respond painfully on being touched except upon increasing pressure, which calls forth a reaction from the pulp proper. With the increase in its size the polypus may protrude from the cavity of the tooth, and by its close contact with the gum tissue may become covered with epithelium. It should be remembered that the normal pulp does not contain this latter tissue, hence the observed epithelial covering is the result of a process of auto-transplantation.

Chronic hyperplastic pulpitis is a comparatively rare disease; it is usually restricted to molar teeth with large crown cavities, and is most frequently observed in the neglected oral cavities of children. It may be looked upon as an expression of a powerful defensive process instituted by a young growing pulp in an otherwise healthy individual.

SUBJECTIVE SYMPTOMS.

Subjective symptoms manifest themselves as an unpleasant sensation, which, however, is not expressed as real pain. Only upon pressure from food crowded

into the cavity is pain felt. Secondary symptoms are rarely observed.

DIAGNOSIS.

Chronic hyperplastic pulpitis is readily diagnosed by physical inspection; its principal diagnostic features are comparative freedom from pain on slight pressure, very free bleeding when wounded, and the presence of one or more peduncles which attach the polypus to one or more horns of the pulp. An explorer inserted into the pulp proper calls forth a very painful reaction, as the pulp is usually found in a chronic state of inflammation. The electric current verifies this latter diagnosis. Pericementitis as a sequel is rarely observed.

The *differential diagnosis* is primarily concerned with the differentiation between a pulp polypus and gum tissue which has grown into the cavity. The rough edges of the cavity may irritate the gum tissue, and ingrowing hypertrophic gum is a very common occurrence. The latter also bleeds very freely, but is painful on being injured. Lifting up the questionable tissue usually reveals its identity. In cases of doubt, packing the cavity for twenty-four hours will clarify the diagnosis.

PROGNOSIS.

As the pulp is usually found in a more or less pronounced state of chronic inflammation, its destruction and removal is indicated. The prognosis of saving the pulpless tooth is good.

TREATMENT.

The treatment of chronic hyperplastic pulpitis consists in the preliminary surgical removal of the granulation tissue and destruction of the remaining pulp. To facilitate the painless amputation of the polypus a drop of liquid phenol is placed upon it and in a few seconds the cauterized head, which now appears as a milk-white bead, may be cut off with a sharp spoon or hatchet-shaped excavator, or a small lancet. Profuse bleeding results. The further treatment, *i.e.*

the removal of the pulp, etc., is carried out as discussed under "Devitalization of the pulp."

7. Degeneration of the Dental Pulp.

This condition is a chronic parenchymatous degeneration of the pulp.

ETIOLOGY.

Atrophy of the pulp is primarily caused by natural senile, retrogressive, metamorphic changes within the pulp tissue independently of inflammatory processes. Pathologists recognize fibroid, atrophic, fatty, and calcareous varieties.

PATHOLOGY.

In the absence of all recognizable symptoms, there is no *clinical picture* to be observed.

Pathologically, degeneration of the pulp is most frequently, and is rather commonly, met with in the teeth of the aged; it is an eminently chronic process. The various types of degeneration present definite pathologic phases, which are, however, only recognizable microscopically. As the clinical practitioner cannot diagnose atrophy of the pulp *in situ*, an *ex cathedra* discussion of its pathology would prove of little service to him. For further information on this subject the reader is referred to the works of Hopewell-Smith, Black, Wedl, Walkhoff, Roemer, etc.

Subjective symptoms are absent.

DIAGNOSIS.

An unexposed atrophic pulp cannot be diagnosed. Complete absence of sensation with negative findings in regard to the color of the tooth, conductivity of

temperature, transillumination, percussion, and the roentgenogram furnish sufficient proof to substantiate the above dogmatic statement. The slightly lowered resistance of a pulp undergoing atrophic changes to the faradic current is too meager a sign to be of diagnostic value in an apparently sound (?) tooth. Naturally, a completely degenerated pulp is a "dead" pulp, and as a consequence no response is obtained by the electric current.

PROGNOSIS.

The extirpation of the atrophic pulp and the subsequent treatment and filling of the root-canal restores the affected tooth to its former usefulness.

TREATMENT.

On opening the pulp chamber of a tooth containing an atrophic pulp, by intent or accidentally, the operator at once is forcibly impressed with two jointly existing conditions which are contrary to his expectations, *i.e.* a partial or more often a total absence of all sensation, and an absolute freedom from putrescent odor. The extirpated pulp presents itself as a shriveled wax-like or fibrous thread of a yellowish transparent color or having a reddish-brown tint. On crushing the extirpated tissue, pulp nodules may be felt. The clinical diagnosis of "atrophy of the pulp" is assured by these findings. Most frequently the root-canals will be found partially or totally obliterated by calcareous deposits. The empty root-canal, in the absence of a bacteriologic examination, should always be looked upon as infected, and treated accordingly as outlined under "Necrosis and gangrene."

(To be continued.)

Extraction *vs.* Treatment.

By WALTER R. HUGHES, D.D.S., Oakland, Calif.

DURING the last decade the dentist has been looking for some method to obviate the complications of root-treatment. He has studied in post-graduate classes for weeks at a time upon this all-important subject. Wise men from far and near have been paid big tuition fees to lecture only upon this branch of dentistry. Finally, as the last word in treatments was spoken, the dentist was advised to check his work with the X-ray.

Fortunate, indeed, for the people of America that this word of warning was given at this time. In no other country is the art of treatment of roots developed to such perfection as in our own country. But when the use of the X-ray was brought into the practice of dentistry our shortcomings were pictured to us, and the cause of great numbers of undiagnosed complaints was soon discovered. Innumerable cases of heart trouble, rheumatism, neuritis, and intestinal disturbances began to improve, or completely recovered, coincidentally with the extraction of teeth.

An appalling state of affairs was recently revealed when a check-up was made upon roots which had been treated and canals which had been filled. There were treated 125 teeth with canals suc-

cessfully filled. Of these 125 roots, which were filled in all degrees of perfection, 103 developed dental abscesses. This was a collection of radiograms representing the work of about twenty different operators which were in the writer's possession for special study. It was noted that twenty-eight had not been treated at all, yet dental abscesses were present. It would be a very opportune time to make a few more check-ups.

What a loss of health! Some are beyond hope of recovery, while others made a speedy recovery of health as soon as the cause of the illnesses was removed. As a second consideration, what an economic loss to the community has been entailed. Whether the dentists received one-half the fee due them or whether they were well remunerated for their services, a financial loss has been sustained. If these teeth had been extracted instead of treated through long, tedious sittings, it would have no doubt resulted in a greater expectancy of life. The time is not far distant when it will be considered a much wiser procedure to extract a tooth as soon as the pulp must be removed, rather than jeopardize the patient's health by its retention.

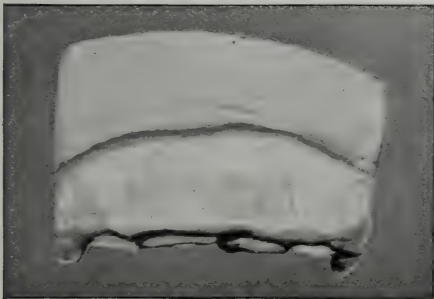
901 FEDERAL REALTY BLDG.

Report of a Case of Acute Leukemia.

By DAVID F. BURKE, D.M.D., Manchester-by-the-Sea, Mass.

RECENTLY it was my privilege to have been called into consultation regarding a patient who had been confined to his bed for three weeks suffering from a mysterious ailment presenting painful bleeding lesions of the gums and severe nasal hemorrhages.

A cursory examination of the oral cavity apparently revealed broken-off roots of teeth emerging from the gums, which seemed pink and healthy. However, a more careful examination showed



that the gums had grown over the teeth as illustrated in the accompanying figure.

Palpation of the gums caused great pain and caused a hemorrhage of chocolate-colored blood, unaccompanied by pus. The tongue presented a chocolate-colored coating (which resisted removal by a tongue-scraper), probably due to medicine stains.

There was no chart kept to give an intelligent history of the case, so I had to get my information from the unfortunate patient, who complained of shortness of breath, severe pain in the gums, loss of taste, and great weakness. I found the temperature 101.5° and the pulse 110.

Feeling that the disease was of more than dental significance, I suggested that expert medical advice be obtained, and five physicians were consulted, besides the physician who had been treating the case; they all failed to make a correct diagnosis. The patient was sent to the Carney Hospital in Boston, where a correct diagnosis of "acute leukemia" was made. Death resulted after six weeks' illness.

According to Dr. Osler, the cause of this disease is unknown. It is common to temperate climates and more common in Europe than here, and more common in males than females. It is also common in some lower animals, such as the horse and dog.

Mental depression and worry are specially mentioned as a predisposing cause, and many patients give an account of a blow or a strain in lifting. It is particularly interesting to note that such was the case of the patient herein described. Headaches are common, due to the anemia.

The diagnosis of leukemia rests upon the determination of a great and persistent increase of leucocytes, the ratio of white to red corpuscles falling below 1:50. Dr. Osler also says that acute leukemia is a very rare disease, associated with enlargement of the spleen, lymphatic elements, and bone-marrow.

Treatment of the disease is only palliative, for it is always fatal. Transfusion has proved useless.

The object of this article is to emphasize the fact that here is another instance where the local manifestation of inflammation is a symptom of systemic disease.

2 SCHOOL ST.

The Diagnosis and Treatment of Oral Infections.

By ALONZO MILTON NODINE, D.D.S., New York City,

ORAL SURGEON AND DENTAL CONSULTANT, FRENCH HOSPITAL OF NEW YORK; LATE CHIEF DENTAL OFFICER A. R. C., GREAT BRITAIN; LATE ORAL AND DENTAL SURGEON, HÔPITAL FRANÇAIS DE NEW YORK, PASSY PAR VERON (YONNE).

(Read before the American Dental Club of Paris, March 11, 1919.)

AT the last meeting of the Club which I had the pleasure to attend, someone made the remark, I believe, that diagnosis is the most important part of our work. That is and at the same time is not true. Sometimes it is impossible to successfully treat a given condition without knowing what we are treating. Then at another time we may successfully treat a given condition when we do not know scientifically what we are treating. Again there are times, did we know what we were attempting to treat, we would not make the attempt.

For a great many years we have been treating conditions about which we knew little or nothing; in so doing we have often been treating symptoms rather than the disease. When we have alleviated the symptoms we were lulled into a false security and believed we had accomplished a cure. But within the last five or six years I have noticed a change in the attitude of most of the better practitioners in the United States, not only in New York, but in the South and all parts of the country. Men are now looking for the cause of conditions, making an attempt to know what the condition is which they treat. Instead of practicing empirically we are beginning to practice scientifically. We are beginning to treat the disease instead of treating the symptoms. In giving postgraduate instruction in different parts of the United States, in talking to a great many dentists, physicians, surgeons, and laymen the conclusion has been forced

upon me that the reason back of this change of attitude, this awakening—I may say, this Renaissance—of dentistry, is the fact that there has been definitely established a connecting link between dentistry and medicine. The establishment of this link is due to another fact. Certain dental conditions have been found to have a most important influence on the general health of the individual. This discovery has been made possible by a more exact and definite diagnosis on the part of physicians and dentists. This more definite diagnosis is due in a large measure to the use of the X-ray. When we talk about radiographs and the X-ray to either a physician or a surgeon, or to a layman, we are talking about something for which they have a great respect and a realization of its great usefulness and value.

Each year sees the value of good dentistry increasingly appreciated. More and more the public is asking for and expecting better dental service. The importance of the dentist in health conservation is now generally recognized. Physicians and surgeons, more than ever before, are seeking the co-operation of the dentist in their efforts to discover and to cure the causes of physical ailments. The dentist is having placed upon his shoulders a great and a grave responsibility, and this responsibility cannot be ignored or shifted. He must be able to help discover the hidden causes of disease often located in the jaws and eradicate them. He must so

perform dental operations that they will not become underminers of his patients' health.

THE VALUE OF THE X-RAY IN DIAGNOSIS OF DENTAL CONDITIONS.

In the light of our present knowledge of the influence exerted by septic mouths, septic teeth, and septic artificial substitutes in the cause of systemic disease, it is as important for a conscientious educated dentist to use the X-ray as to use a sterilizer. The more skilful and the more careful the dentist, the more keenly he recognizes the necessity for and the value of the X-ray. The dental surgeon is no longer concerned solely with the repair, the treatment and the replacement of the teeth. He is concerned more seriously with the patient's health and life.

Evidence accumulates with increasing rapidity that abscesses on the ends of devitalized teeth play a most important part in the cause of many cases of endocarditis, rheumatism, neuritis, nephritis, gastric ulcer, appendicitis, and other diseases, and it is only by an extensive and systematic diagnosis with the X-ray that these abscesses are discovered. Experience brings out the startling and almost unbelievable fact that about 90 per cent. of devitalized teeth have either incomplete or no root-fillings. Fully 75 per cent. of these show destruction of the bone and infection around the apical ends of roots. All such cases may be demonstrated by the radiograph. While the X-ray is of value in discovering these foci of infection, it has a still greater value when employed for the purpose of making the complete filling of most of such roots possible and certain.

We thought we could diagnose the extent of pyorrhea infections by means of our digital skill alone, but this has proved about as uncertain as has been our filling of root-canals. And the uncertainty and unsuccessfulness of this operation has been previously stated, namely, that it is only about 10 per cent. successful. Pyorrhea is an infectious

focus, so that if we fail to successfully diagnose and find out the extent of the infection it is quite reasonable to believe that we may fail to successfully treat and eradicate the infection. I have seen pyorrhea treated for alveolar abscesses and alveolar abscesses treated for pyorrhea by those who did not possess an X-ray of the condition they were treating. I have seen absolutely hopeless teeth, teeth held in place by the force of gravity and a little gum tissue, being treated for pyorrhea, in which, if the proper diagnosis of the condition had been made, the dentist and the patient would have been saved the time uselessly and harmfully expended. Such efforts on the part of the dentist result in the loss of confidence on the part of the patient and perplexity and dissatisfaction on the part of the dentist. To fail to get a desired result even though we are paid for our effort is no satisfaction to us, particularly so when we realize that, had we employed a method of diagnosis available to us, we could have avoided failure. The employment of the X-ray removes the diagnosis and treatment of dental diseases, and conditions associated with them, from the realm of guesswork and doubt to that of comparative positiveness and certainty.

The X-ray clearly demonstrates that surgical operations on the teeth must be performed in a surgical manner, and when so performed and checked up by the X-ray the patient may enjoy an immunity and permanency hitherto impossible to attain.

The orthodontist, the prosthodontist, the exodontist, the oral surgeon, the general practitioner, each finds the X-ray of peculiar and positive value in the diagnosis and treatment of the special conditions which may come under his care. In co-operation with the physician he may employ the X-ray and interpret its findings with a knowledge and skill that the physician rarely possesses. In New York State the testimony of a physician on a dental X-ray is not competent testimony.

The X-ray not only saves the patient time and money, but what is of supreme

importance, it may save his health, which is priceless. Its use establishes in the patient's mind a feeling of security and confidence.

The dentist finds in its employment an interest, a satisfaction, and a security that make possible, so far as it is within the range of his special knowledge and training, his assuming the great and grave responsibility of protecting and preserving the health of his patients. In these general terms a fair estimate of the value of the X-ray in dentistry may be described. What a searchlight and chart are to the navigator of a ship, the X-ray and radiograph are to the dentist. That captains sailed into difficult and dangerous harbors in foggy and uncertain weather without the searchlight and chart is true; that they would continue to do so without them is equally true. That dentistry was practiced, and was practiced well, before the use of the X-ray is true. That it perhaps would be practiced well were the X-ray never used is also true, but there would not be much difference between a captain entering a dangerous harbor without a chart and searchlight at night with a valuable cargo and a dentist trying to diagnose and operate upon an obscure and uncertain case without the X-ray.

To point out that which is the greatest thing the X-ray has done for dentistry is difficult, with any degree of confidence or satisfaction to myself; nevertheless it may be most positively said that the X-ray has reformed and revolutionized dental practice. One thought comes to me with persistent insistence. The X-ray has made us practice better dentistry; the X-ray has done away, to a large extent with the "I'll do the best I can and take a chance." Now, the X-ray not only convinces us that the chances others and I took were disastrous, but it shows us something still better—we can eliminate the necessity and the temptation to take the chances we formerly took. When we did not use the X-ray, if we broke a piece of root off in extracting a tooth, we took a chance, left it in, and expected it to work out. Now we do not take that chance, because too

many radiographs bear witness to the fact that a piece of root left in the jaw is dangerous practice.

When we did not use the X-ray, if we could not fill a root-canal to the end, we took a chance and filled it as far as possible, and then took another chance that it would not cause any trouble. Now, because we use the X-ray, we can fill more roots to the apex, and in the case of those we cannot fill we either extract the teeth or resect the roots. When we did not use the X-ray and certain teeth were missing or unerupted, we took two chances—one that they were not there, and the other that they were. In either case we took a chance of trouble. We might perform a useless operation, or we might neglect to perform a necessary operation. How many of us have spent a great deal of time looking for root-canals that existed only in our imagination, and how many times did we fail to fill root-canals because we did not imagine they were there! But the time uselessly expended and the potential source of trouble we left unattended to could have been saved by the employment of the X-ray.

INFLUENCE OF THE X-RAY ON ORAL SURGERY.

In the field of Oral Surgery we find the wrecks and wreckage of careless, unsanitary, septic, and sometimes almost criminal dentistry. I find almost 75 per cent. of the oral surgery I do is the result of bad dentistry. When these patients come to the oral surgeon—the court of last appeal—to save their health and perhaps their life, imagine the responsibility when perhaps the skilled efforts of all others of the healing art have given no relief! Imagine the carnage that would ensue did the oral surgeon not first have radiographs of the teeth and jaws—charts and surveys of these organs. It would seem almost impossible for oral surgery to have attained the high standard of excellence it has if the use of the X-ray had been denied it. The various conditions in which radiographs serve the oral surgeon are too numerous to mention. That the X-

ray is an infallible guide no one who has taken many radiographs will for an instant maintain. Those who affect any such attitude either never have had, or have lost, the saving grace of common sense. But the more radiographs a dentist takes—and I believe that every dentist should have his own X-ray machine—the more respect he has for the radiograph, and the evidence of the radiograph, taken in conjunction with other tests, symptoms, and signs, may make his diagnosis more certain and more dependable. Further, the more radiographs a dentist takes in his daily practice, the more expert he becomes in their interpretation. By some subconscious processes he acquires an X-ray sense for interpreting the radiograph. In the practicing of any technical procedure a man subconsciously acquires a highly developed sense for that procedure which at the beginning he did not possess, and which it is difficult to explain or impart to the novice. It is analogous to the secret of the successful surgeon—the ability to distinguish the sound from the unsound tissue. The ability to determine this is not acquired in a day, but comes with experience; it comes subconsciously.

The microscope and the bacteriological incubator are also important and valuable agents in diagnosis, as are all the other diagnostic instruments, agents, and tests with which you are familiar, such as the determination of the vitality of the dental pulp by color or translucency of the tooth, the use of the ethyl-chlorid spray, a stream of ice-water or a hot instrument, the use of a mild alternating electric current, the transilluminating lamp, and the violet ray, as well as such physical signs as swelling, tenderness, pain, color, and scars, the texture and density of tissue, and the history, age, and habits of the patient. When a patient has been sent to us by a physician or surgeon to look for a focus of infection in the mouth after he has eliminated every other possible site of infection, what do we do? When I speak of physicians I also include our dental colleagues.

We may conveniently divide infections into three general classes: (1) Those infections which have their origin in the tissues that surround the tooth, which we shall for convenience call gingival infections. (2) Those infections which have their origin at the apex of devitalized or semi-devitalized teeth, which we shall call apical infections. (3) Those infections which are found in the jaw-bone proper, such as cysts, impacted or unerupted teeth, bone tumors, necrosis, foreign bodies, etc.

Whatever class of infection we may mentally catalog the patient to be suffering from in a casual examination of the mouth, we immediately want to know more, and the agent that, nine times out of ten, will give us the most complete and convincing testimony is the X-ray. The testimony that the X-ray gives us is so surprising and so convincing that often we find it necessary to back out of our snapshot or neutral diagnosis and place the condition in another or in all classes of infection. But sometimes the X-ray does not give us the information we want; sometimes the infection has not gone so far or so rapidly as to destroy the bone, and sometimes because of the technical difficulties encountered the X-ray does not give the testimony desired; then we may use the other diagnostic agents.

It is common experience to find that 90 per cent. of all devitalized teeth have incomplete or no root-canal fillings, and that 75 per cent. have radiographic evidence of infection. From this fact and for the reasons which I have previously mentioned that make this fact so important, we must, out of justice to our patients, suspect and look for devitalized teeth. The additional reasons for this I shall give later at greater length. When the X-ray does not give us the evidence we are looking for, we may use other agents to determine the vitality of the pulp, and sometimes it is necessary for us to drill into a suspected tooth. We need our dental probes, because it may be necessary to use them to discover cavities and the presence of pyorrhea pockets. In order to make a good diag-

nosis we must not become obsessed with the infallibility of any particular diagnostic agent, because the wider and longer experience a man has, the greater will be the caution with which he relies upon any one agent.

INFLUENCE OF ORAL INFECTIONS ON THE SYSTEM.

The important influence that oral infections exert upon the physical well-being of an individual I have but lightly touched upon. This importance cannot be passed over without calling to your attention some of the effects produced by these infections. We have all had the common experience of seeing an almost miraculous improvement in a patient's health after we have corrected some dental disorder or condition. Most of these corrections are either complete eradications or reductions in the source of infection found associated with the teeth and jaws. We have all had the common experience of seeing patients gain from ten to thirty pounds; anemic patients take on the color and bearing of perfect health; cripples walk; headaches disappear; eyesight improve; weak and nervous patients grow strong and their nervousness disappears. We have seen these improvements and cures when we knew that no other treatment was pursued and no other treatment was possible until the dental disorder was corrected. This is no academic problem; it is no mere topic of conversational dentistry, but it is a practical, everyday experience with which we are all familiar. We must naturally assume from the accumulated testimony of thousands of cases that either dental disease conditions caused or contributed to the cause of these systemic or organic maladies, or that what brought about these changes was something peculiar, and about which we are hopelessly ignorant, associated with technical processes we have used to correct these conditions. For reasons which will come out later, I am slightly biased in favor of the first proposition, namely, that dental infections are frequently the cause of systemic or organic diseases, and

that in all cases dental infection is an insidious underminer of the patient's health and resistance.

EFFECTS OF ORAL INFECTIONS ON THE SYSTEM.

These infections produce their effects in several ways. Gingival infections and infections in which pus is produced and is either discharged into the mouth and swallowed or absorbed from a suppurating cavity, or cases in which the pus is discharged into the soft tissues of the face and neck, produce their effects in the following manner:

(1) The outpouring of lymph and leucocytes to combat the destructive processes of the infection is a constant drain upon the system's resisting powers. It lowers those powers in the individual so infected in two ways: (a) The individual's resistance is lowered by nature's effort to repair and combat the destructive processes in the diseased tissues. (b) The absorption of pathogenic micro-organisms and toxins from these pathological tissues also lowers the resistance of an individual otherwise in sound physical condition.

(2) Examination of the blood of patients who have marked pyorrhea and gingival infections shows a condition resembling that found in puerperal fever and advanced carcinoma.

(3) It has not as yet been recognized that micro-organisms from gingival infections produce any specific organic or systemic disease or disorder.

(4) But gingival infections among other infections from other organs and other locations are recognized as being one of the possible and common sources of infection that produce directly or indirectly or contribute to the cause of the following pathological conditions: (a) Serious, grievous, and dangerous diseases of the heart, as endocarditis, myocarditis, pericarditis, pancarditis. (b) Serious and insidious diseases of the nervous system—

(1) Indirectly; producing nutritional disturbances, anemia, and toxic

states in which the nervous system suffers, as nerve exhaustion, hysteria, hypochondria, neurasthenia, psychasthenia.

(2) Directly: gingival infection has been held by some to have caused cases of (a) epilepsy, (b) bulbar paralysis, (c) lesions in the brain and spinal cord (the infection following the lymph spaces of the nerve trunks), (d) neuritis.

(5) (a) Pernicious anemia. (b) Anemias of the secondary type, including streptococcal and pneumococcal and other infections of the blood. (c) Leukemia.

(6) Chronic infections are almost invariably associated with glandular syndromes. These infections are usually focal in character and seem to occur with the same relative frequency in insufficiency of the thyroid and pituitary glands and the adrenals: (a) Thyroid intoxication. (b) Thyroid enlargement. (c) Thyroid deficiency.

(7) Nephritis.

(8) Skin diseases:

(1) Those related to joint affections: erythema nodosum; erythema multiforme; gouty eczema, psoriasis.

(2) Those neuropathic in character: lichen planus, lichen simplex (Vidal); herpes simplex; neurotic eczema; herpes zoster; alopecia areata; dermatitis herpetiformis, scleroderma; vertigo.

(3) Those related to tuberculosis: erythema induratum; lupus erythematosus; lupus vulgaris; lichen scrofulosus.

(4) Those having some relation to anaphylaxis: eczema, urticaria, erythema multiforme, angioneurotic edema.

(5) Miscellaneous affections: rosacea, granuloma annulare, chilblains, Raynaud's disease.

(6) The presence of gingival infections is believed in many cases to supply the material for the infections of the tonsils and throat, these sites passing on the infection to those

organs, tissues, and system for which the tonsils have been held to be the infectious factor.

I believe it has not been held by anyone that focal infections or dental infections of any kind are the specific and the only cause of any definite disease or disorder. It seems to me that anyone who sets up any such absurd proposition in order to discredit and disqualify the importance of dental infections is not competent to discuss this subject in a sensible manner. The published statements of some men compel me to call your attention to this notion as applied to apical infections. Many men have been misled by the popular idea that all infections originate in pus; that unless pus is present there is no evidence of infection. Others look for the odor of putrefaction, and if no odor is present there is no infection. Others look for pain; if the patient has no pain, if the tooth is comfortable, there is no disease present; there is no infection!

The infections which cause the most trouble, the infections which are most insidious, are those which have none of these symptoms. The patient who has these infections suffers no pain or discomfort and is not conscious of any departure from the normal. The dentist also may upon casual examination discover no apparent deviation from the normal. Only when the X-ray is employed or a bacteriological examination is made is the source of infection discovered. The micro-organisms which are most dangerous—particularly the streptococcus viridans—are of so low grade and propagate so slowly in the confined walls of the alveolar bone that they set up no violent reaction, and destroy the bone so slowly or are absorbed so slowly that they give no physical discomfort. Further, these infections produce their effect so remote in time and place from their origin that the original source of the infection is frequently ignored or overlooked.

A focus of infection is a circumscribed area of tissue infected with pathogenic micro-organisms, and when

located in the jaws may produce effects upon different organs and systems of the body.

These effects may be produced in four ways:

(1) By so lowering the systemic resistance that an invasion of another micro-organic host may establish a more serious infection.

(2) By the absorption of toxins.

(3) By the transfer of the micro-organisms to some organ or system whose resistance has been reduced.

(4) By metastatic emboli of clumped micro-organisms which have become detached from some focus. The most common effects of focal infections located in the jaws, together with focal infections located in other parts of the body are: Thyroid deficiency, infectious arthritis, leukemia, myositis, neuritis, goiter, asthma, nephritis, anemia, pernicious anemia, toxic hepatopathy, gastric and duodenal ulcer, appendicitis, cholecystitis, endocarditis, myocarditis, pancarditis, hypertension, arterio-neuritis, acute mania, melancholia, dementia præcox, hysteria major, neurasthenia, psychasthenia, epilepsy, lesions of the brain and spinal cord, bulbar paralysis.

Focal infections located in the jaws about the apices of diseased teeth have also been the cause of infections in the eye, ear, nose and accessory sinuses. Most of the effects that have been previously ascribed to gingival infections may also be caused by apical infections in a more certain and insidious way, because the infection is pent up in the jaw-bone, causing absorption and distribution which is constant. On the jaw the infections produce—

(1) Gradual destruction of the bone, which may extend to such a degree as to destroy the vitality of one or several teeth.

(2) Production of cysts which by extension may invade the nose or maxillary sinus.

(3) Cysts may so weaken the lower jaw as to produce pathological fracture.

(4) The chronic irritation of their

pathological contents may result in malignancy.

(5) Infection of the glands of the neck.

STERILIZATION OF ROOT-CANALS.

What are we to do with these local infections connected with devitalized teeth—those infections which originate in diseased or devitalized pulps? From the experiments of Lieut.-col. Kenneth Taylor in Paris, on sterilization of infected bone or sequestra, he found that "The persistence of bacteria for such a long period within the bone is probably due to the mechanical protection afforded by the dense structure of the bone itself for the organisms present within the spaces and the canaliculi. They are protected from the body fluids and phagocytic cells. Leucocytes were rarely seen within the bone in any of the sequestra sectioned. Furthermore, the bacteria are protected from any antiseptic which may be introduced into the wound. A few attempts to sterilize bone sequestra *in vitro* by strong antiseptics were sufficient to demonstrate the improbability of accomplishing this result within the wound. Small splinters of only a few millimeters in diameter may be soaked in alcohol 75 per cent., hydrogen dioxid, Dakin's solution, bichlorid of mercury 1:10,000, 5 per cent. carbolic acid, or tincture of iodine, for half an hour or more, and a good growth of organisms obtained after breaking and re-sowing the splintered bone into a suitable medium."

Professor Latham of Chicago and Dr. Price of Cleveland state that from experiments carried out by them they had found it practically impossible to sterilize infected root-canals, and further that sterile root-canals could be kept sterile not more than a few hours. For anyone who believes he can sterilize and keep sterile a root-canal, the following experiment is suggested: After completing whatever method of sterilization you may use, seal in the root-canal some sterile cotton for from twelve to twenty-four hours. Then remove the cotton and

make bacterial cultures in different media. The result will be most surprising.

From these experiments, from my own research, and from the common experience of myself and others, I am led to believe that every devitalized tooth is a septic tooth. It is septic because the density of the tooth prevents the penetration of antiseptics, while its tubular structure also allows the penetration of bacteria from the denuded apical area. There is not in a devitalized tooth that ebb and flow of living fluid in the tubules and there is not that replacement of dead and worn-out substance in the tooth with new and healthy material. The tooth is unable to maintain that natural resistance to the encroachment of disease and infection which a healthy vital tooth possesses. A tooth having a healthy pulp with its intact bloodvessels and lymphatics is capable of having its infection washed away and of having its infection overcome. The infection which even a healthy pulp is able to overcome, I believe, must be very small and not pyogenic. Any marked deviation from the normal healthy condition causes the pulp to succumb because of the peculiar structure of the tooth and the conditions which surround the pulp.

If the conclusions of our subsidized investigators and the experience and experiments of scientific men are correct, we are confronted with this problem: What are we going to do with teeth which have been intentionally devitalized, accidentally devitalized, or pathologically devitalized? Pyorrhea presents no such problem. Because I believe all that I have said to be true, I am not shutting my eyes to some other important facts which you have been thinking about as well as myself, viz:

(1) The smaller the amount or the smaller the dose of infection that is introduced into the system, the more quickly and more ably are the system's resisting forces able to overcome and neutralize that infection.

(2) The resisting powers of the healthy individual are able to overcome a limited amount of continuous infec-

tion. What that limited amount is, and what particular infections it is able to continually overcome, I do not know that anyone has had the assurance to state. Please bear in mind that I am speaking of the so-called apparently healthy individual—such an individual as when examined by a skilful physician will be put in class A.

(3) We also have the consoling thought that the radiograph has also revealed that in those teeth in which the root-canals are filled to or slightly beyond the apex—so filled that there is no space between the walls of the canal and the root-canal filling so far as radiograph evidence is concerned—instead of there being 75 per cent. of these teeth showing bone destruction at the apex, as in the case of those teeth with incomplete or no root-canal fillings, we find that less than 10 per cent. have this destruction.

(4) In those cases in which prior to filling the tooth there existed an apical infection, I believe if we surgically remove that infected root-end and the infected tissue surrounding the apex of the tooth we shall reduce the infectibility of that tooth a very great deal.

(5) The more care we exercise in removing from a root-canal infected material and the remains of the pulp, the less amount of infection we introduce into that canal, and the more solidly and completely we fill that canal, the more shall we minimize and neutralize the infecting power of the tooth.

(6) I also believe the less the number of devitalized teeth, even if perfectly filled, a healthy person possesses, the longer and the more surely will that person preserve his health.

(7) When we are treating a patient whose health is subnormal, who has any systemic or organic disease, an entirely different proposition confronts us, and the quicker and more completely we eliminate from the mouth any active or potential source of infection the better, even if we destroy our patient's hopes of having a beautiful piece of septic bridge work placed in the mouth. And when we attempt to eliminate the source of infection, whether in a healthy or

sick patient, or whether it be a pyorrhea pocket, an impacted third molar, a dental cyst, or an apical infection, I believe we should eliminate it. I believe it should be done in a careful, thorough, and surgical manner. The more careful, thorough, and complete has been the technique employed, the more certain, enduring, and satisfactory have been my results.

When we are confronted with a pyorrhea pocket, or a series of pockets, the pocket is removed, obliterated along with the adjacent infected tissues, whether bone or soft tissue, and this is done under an anesthetic in a surgical manner. The results amply justify the means. When we are dealing with an impacted third molar we remove it surgically and treat the condition surgically. It is better to take the time to carefully remove the bone that is detaining the tooth rather than forcibly extract the tooth and fracture the jaw.

When we are dealing with a dental cyst, we remove the diseased bone and tissue surgically and treat the condition surgically, and we get the happy results which we anticipate. When we are dealing with an infected apical root-end, we eliminate that in a surgical manner and treat the condition in a surgical manner. Such cases as I have mentioned are largely surgical cases, and along with our surgical treatment there are other conditions to correct which are corrected in the manner which has proved most successful with us. Excepting the prevention of, and the preservation of the teeth and the tissues of the mouth from, the

conditions that have been mentioned, I very sincerely believe this to be the most important matter that confronts the dental profession today.

CONCLUSIONS.

(1) The dental profession has been raised to a higher plane by the establishment of the fact that oral infections have a positive effect on the health of the individual.

(2) The establishment of this fact is due largely to a more exact diagnosis by the use of the X-ray employed to discover these infections.

(3) The public is demanding better dentistry and is placing its confidence in the dentist who employs the X-ray and other diagnostic agents to discover these infections.

(4) The dentist should so practice his profession or employ such methods as will obviate the possibility of the teeth and tissues upon which these methods are practiced becoming foci of infection.

(5) When these infections are discovered they must be eradicated in a careful, complete, and surgical manner.

(6) The present and future health of a patient must be preserved regardless of the fact that teeth may be sacrificed to do so.

(7) The prevention of the conditions which make possible these focal infections is the highest form of service a dentist may render. He may be able to restore only in an incomplete functional manner.

8 W. 40TH ST., NEW YORK CITY.

A Critical Consideration of Dr. G. V. Black's Method of Making and Testing Dental Amalgam Alloys.

By WM. W. ATKINSON, Philadelphia, Pa.

HON. MEMBER MONMOUTH COUNTY (N. J.) DENTAL SOCIETY; LECTURER DEP'T OF METALLURGY,
EVANS INSTITUTE, UNIVERSITY OF PENNSYLVANIA.

(Read before the Pennsylvania Association of Dental Surgeons, Philadelphia, May 13, 1919.)

THE Bureau of Standards has undertaken an investigation of the standard adopted for dental amalgam alloys by the Dental Corps of the U. S. army. This standard has been described by the War department as follows: "No fixed formula for dental alloy; same must, however, comply with the general well-known standards fixed by Dr. G. V. Black of Chicago."

The director of the Bureau, Dr. S. W. Stratton, requested that a G. V. Black micrometer and dynamometer should be loaned to the bureau for the purpose of testing their accuracy. Accordingly, those belonging to the Thomas W. Evans Museum and Dental Institute were taken to Washington. The report upon those instruments, dated January 17, 1919, is as follows:

[COPY.]

WHS: LDC.

Div. 11-1

DEPARTMENT OF COMMERCE—
BUREAU OF STANDARDS.

REPORT on—

1 AMALGAM MICROMETER. 1 AMALGAM DYNAMOMETER (BLACK TYPE). Submitted by the Thomas W. Evans Museum and Dental Institute, Fortieth and Spruce sts., Philadelphia, Pa.

The above-described instruments have been inspected and found unsuited for an accurate determination of the properties which they were designed to measure.

The Micrometer calibration on a 0.0580 inch interval showed a variation of 13/10000 inch from the true value of the total length.

The rate of this variation was not constant, and intervening values departed from the assumed average rate by as much as 0.0001 inch. This intervening variation was not constant, and is thought to represent the limits of accuracy of the micrometer; which may be assumed as ± 0.0001 inch.

A temperature change of 30°C. introduced an error of 0.0001 inch in a reading that should have remained constant had the instrument been compensated for temperature variation.

The Dynamometer showed readings in error by 20 lb. at certain intervals. A fundamental error exists in the size of the specimens used. Crushing tests made with this instrument showed variations of more than 50 per cent., whereas larger specimens of the same materials when crushed in the Bureau's standardized instruments show very small variation.

Respectfully,

[Signed] S. W. STRATTON, *Director*.

BUREAU OF STANDARDS, WASHINGTON, D. C.

January 17, 1919.

The nature of this report makes a critical consideration of Dr. Black's work in the field of amalgam alloy timely, inasmuch as his method of alloying depends fundamentally upon the accuracy of his testing instruments.

THE G. V. BLACK MICROMETER.

Dr. Black's micrometer is described in his "Operative Dentistry," vol. ii—see Fig. 400 (plate preceding p. 305), and also in the DENTAL COSMOS, August 1895, p. 644. This instrument is an

elaboration of other coarser measuring instruments of the same type, the scale having been enlarged and the multiplying mechanism changed so that a reading of 1/10000 in. on the dial is said to be possible. The measurements are taken from the face of a circular solid cylinder of amalgam seated in a cavity $\frac{3}{8}$ in. diameter by $\frac{1}{4}$ in. deep. The cavity itself is drilled into a circular tube of hardened steel 1 in. diameter by $\frac{1}{2}$ in. deep, which tube was suggested by Dr. E. K. Wedelstaedt of St. Paul, Minn., an investigator of amalgam alloy and to some extent a collaborator with Dr. Black.

Let us consider the claims that Dr. Black has made for this micrometer. In his "Operative Dentistry," vol. ii, under Fig. 400, he says, "The amount of variation is read in gradations of one ten-thousandth of an inch."

The Bureau of Standards' report on the micrometer includes the following: "The micrometer calibration on a 0.0580 in. interval showed a variation of 13/-10000 in. from the true value of the total length. The rate of this variation was not constant, and intervening values departed from the assumed average rate by as much as 0.0001 in. This intervening variation was not constant, and is thought to represent the limits of accuracy of the micrometer; which may be assumed at ± 0.0001 in."

Commenting upon this, a 0.0580 in. interval is $96\frac{3}{4}$ per cent. of the entire range of the micrometer. The percentage of error is $2\frac{1}{10}$ per cent. It can be seen that there can be an error of one point or more in either direction when the reading on the dial shows no change of dimension. In connection with Dr. Black's claim I would say that the design, manufacture, and duplication of any instrument for the repeated, accurate, and invariable mechanical measurement of 1/10000 in. intervals, termed by Dr. Black "points," are surrounded by many factors of possible error, such as vibrations, thermal changes, effects of friction in the play of the several parts, and equally important, the personal equation.

Another claim of Dr. Black for his micrometer (see "Operative Dentistry," vol. ii, under Fig. 400) is that "The metals entering into its construction are so arranged as to eliminate errors from temperature changes."

The Bureau of Standards' report includes the following statement: "A temperature change of 30°C. introduced an error of 0.0001 in. in a reading that should have remained constant had the instrument been compensated for temperature variations." These figures are significant when it is considered that 30°C. equals 54°F., and fifty-four degrees represents about the difference between summer and winter temperatures. I cannot find that in Dr. Black's work he has ever recommended temperature control in volume measurements. On the contrary, he has stated (DENTAL COSMOS, August 1895, p. 643) that he has ignored it within the range of temperatures in which he worked.

THE WEDELSTAEDT TUBE.

The Bureau of Standards determined the coefficients of dental amalgam and of steel. These were given in a paper read before the American Physical Society, New York, by Peters and Souder, May 1, 1919. The coefficient of thermal expansion for dental amalgam was given as 25-28 microns per meter per 1°C.; for steel, 11-12 microns per meter per 1°C. Hence it can be seen that over a range of 30°C. there are changes at the full limits of temperature change of 333-360 microns per meter on the steel, and 750-840 microns per meter on the amalgam, the amalgam, thus showing a coefficient about $2\frac{1}{2}$ times greater than that of the steel tube. This means that, with advancing temperature, the steel tube would exert lateral compression upon the plug of amalgam, squeezing it above its surface and thus showing a false expansion, or, conversely, it may show false contraction. This error may be added to that determined by the Bureau of Standards in its consideration of the effect of temperature on volume measurement.

A third claim of Dr. Black for his micrometer is ("Operative Dentistry," vol. ii, under Fig. 400): "When a first measurement of an amalgam filling has been registered, the tube may be removed and returned for a measurement at any future time. If at another time the needle swings to the left of the former measurement, the amalgam has shrunk. If it stops to the right the amalgam has expanded." In contradiction to this, no accurate repeat tests can be assured for such instruments. Here the human equation again enters into consideration, for even with the most elaborate precautions and the most careful seating of the Wedelstaedt tube, an error of adjustment is possible which would register on the scale. Dr. Black describes an expedient to which he resorted in the progress of his tests as follows (DENTAL COSMOS, August 1895, p. 643): "After a trial, a difficulty presented itself in that it was found that the amalgam in the process of setting threw up crystals on its surface that caused a derangement of the measurements, making an apparent expansion. This was overcome by fixing a thin bit of steel one-hundredth of an inch thick and a tenth of an inch square, in the surface of the filling while finishing it, and making the contact on that." What Dr. Black terms "the throwing up of crystals" is known in metallurgy as dendritic growth, the crystals being termed "dendrites" from their arborescent or tree-like form and arrangement. They are either crystals of free metals or of inter-metallic compounds that have formed in the cooling mass of alloy. Dr. Black's mistake rests in his belief that he could overcome this by covering the surface involved with the slip of steel, when as a matter of fact this dendritic growth occurs on the amalgam whether it is covered by the steel disk or not, and sometimes it exerts enough upward pressure to push the disk out of position.

THE G. V. BLACK DYNAMOMETER.

This instrument is an adaptation of a similar one, and is described by Dr.

Black (DENTAL COSMOS, May 1895, p. 406). He first used this instrument to test blocks of human teeth, and later amalgam. His description is as follows: "For trial of the strength of these blocks I have used a dynamometer constructed for another purpose by Tiemann & Co. of New York, which I have adapted to this work. It consists of a steel spring in the form of a double bow, which, when compressed, exerts stress or force of 350 lb. avoirdupois. It is provided with cog-work and a dial for the registry of any number of pounds within that compass. This has been arranged so that the spring is compressed with a screw, and the stress exerted by the spring is applied through a steel rod acting upon a fixed support. The block of dentin the strength of which is tested is placed between the end of this steel rod and the support so as to receive the stress exerted."

Illustrations are shown on pages 408-409, DENTAL COSMOS, May 1895, of the original dynamometer, which registered 1100 lb.

In the Bureau of Standards' report we find the following: "The dynamometer showed readings in error by 20 lb. at certain intervals. A fundamental error exists in the size of the specimens used. Crushing tests made with this instrument showed variations of more than 50 per cent., whereas larger specimens of the same materials when crushed in the Bureau's standardized instruments showed very small variations."

The Bureau's finding of an error of 20 lb. at certain intervals means an error of 3768.2 lb. per square inch. The "fundamental error in the size of the specimens" is one easily comprehended by anyone familiar with the testing of engineering materials, for it rests upon the factor known as "the percentage of error." Thus a specimen 85/-1000 in. square showing an apparent strength of 200 lb. but with an error of 20 lb., means an error of 10 per cent.; while a specimen 1 in. square showing a corresponding strength, or 27,654 lb., with an error of 20 lb. has an error of

approximately 7/100 of 1 per cent. The smaller specimen thus magnifies the error nearly 1400 times.

Another factor of error is that the rate at which the force is applied is not under automatic control, for it is exerted by means of a thumb-screw turned by hand. There is an interval of rest between each turn of the screw, an intermittent stress which distorts any reading upon the instrument. This lack of automatic control is responsible for many errors due to variations of strength and temperament of the individuals making the tests.

The findings of the Bureau of Standards for the G. V. Black micrometer and dynamometer are in complete accord with the criticisms of them which I have advanced in lectures at the Thomas W. Evans Museum and Dental Institute to the classes in metallurgy, and elsewhere.

THE GNATHODYNAMOMETER.

Supplementing the micrometer and dynamometer tests, Dr. Black followed up a line of tests which had been instituted by others for the purpose of ascertaining the amount of force exerted by the human jaw in mastication. The testing instrument for this purpose was termed a gnathodynamometer, and resembled Dr. Black's other instruments in that it was a modification of another instrument. It resembled in its operation a pair of flat-nosed pliers. Upon the outer portion of its jaws were placed rubber pads for the protection of the teeth during the tests. A steel spring received the stress and transmitted it to a small dial attached to the instrument, where the force exerted was registered in pounds avoirdupois.

The consideration alone of the variation of movement of the human jaws shows the impossibility of scientific control over the gnathodynamometer; and therefore the results secured from its use, as shown in Dr. Black's tables, must be considered with reserve.

DR. BLACK'S METHOD OF ALLOYING.

In considering Dr. Black's method of making and testing dental amalgam

alloys the various details are taken from his series of articles published in the DENTAL COSMOS, 1895-96, under the titles "Physical Characters of the Human Teeth," etc., and "Physical Properties of Silver-Tin Amalgams," and from his "Operative Dentistry," vol. ii, 1908, chapter on Amalgam; also, necessarily, from statements of dental writers and lecturers, some of whom have quoted from Dr. Black and enunciated his ideas without giving any reference to a published source. Some of these statements are explanations and claims for the "method" from those who were instructed in the special course in amalgam alloy making which was conducted by Dr. Black. In neither Dr. Black's articles in the DENTAL COSMOS 1895-96 nor the chapter on Amalgam in his "Operative Dentistry," is there to be found any statement covering the method of alloying which Dr. Black advocated. Let us review this method and the ideas governing it.

(1) A dental amalgam must expand in setting. The range of expansion should be from $\frac{1}{2}$ point, or 1/20000 in., to 5 points, or 5/10000 in. It should have no contraction. The desirability of expansion for amalgam is conceded. Dr. Black's conception of expansion and contraction was that each is a change of bulk. (See DENTAL COSMOS, August 1895.) This is an error, in that all dental amalgams expand in setting, that is, they actually increase in bulk; conversely, they *do not contract*, or decrease in bulk, in setting. Dr. Black gives no explanation of "change of bulk." Here, as at all times, he has ignored the constitution of the alloy itself, and relied for his information upon surface measurements. An explanation of change of bulk is that physical reactions occur between the alloy and the mercury whereby there is relief of the state of strain or condensation which had been set up by the sudden chilling of the melted alloy when poured into an ingot mold of much lower temperature than that of the alloy, also by chemical reactions which have caused new series of crystals to form, which have changed in

volume values. The occurrence of these chemical reactions affects the shapes of the crystals, the direction of their growth, and the incidence of their orientation; in dental amalgam these reactions result in expansion. During the setting the amalgam is in a state of internal motion as a result of chemical reactions. There can be an apparent contraction, as, *e.g.*, in the case of a G. V. Black test, the amalgam in the Wedelstaedt tube expanding over the free surface of the tube could form a trough-like depression in its center which could cause deformations of the margins of the amalgam by which they would recede from the walls of the tube. The micrometer in such an instance would register contraction, although there had been actual expansion. Hence, what has been believed to be contraction resolves itself into mere change of form.

From the foregoing it can be seen that Dr. Black's ideal, as he expresses it in "Operative Dentistry," p. 310, vol. ii—"an alloy that would absolutely lie still while hardening"—is unattainable.

(2) Dr. Black stated that great strength is necessary for an amalgam filling—a strength beyond that required to resist the thrust of the jaw, giving a safety margin such as is demanded in engineering practice. This strength has been stated as 350 lb. compression over an 0.085 in. cube of amalgam. The necessity for a high degree of strength in filling materials has long been recognized by dentists, and the power of the human jaws has been considered as the reason for the necessity. To Dr. Black belongs the credit, however, of having given definiteness to the requirement by approximating, within the limits of accuracy of his machines, the degree of strength that is needed, and also of having shown that amalgam is the only material that has such strength.

(3) Dr. Black stated that amalgam flows under comparatively light stress; that is, "it creeps out from under a load." He says (DENTAL COSMOS, July 1895):

In this particular the silver-tin amalgams seem to be an anomaly among metallic compounds, for they are at the same time both

very brittle and very ductile. If struck with a hammer they fly to pieces, but if subjected to a comparatively light stress, either continuous or intermittent, they may be drawn out into thin laminae or molded into any form without breakage. . . . For want of a better term, I shall call this yielding of the amalgam *the flow of amalgam under stress*, or simply *flow*. I wish to say, however that it is something quite different from that which is described as "*the flow of solids*" in works on engineering. Burr ["Elasticity and Resistance of the Materials of Engineering"] describes the flow of solids as the movement that takes place among the particles of a malleable metal, upon or among themselves, when the mass is struck or pressed upon with such force as to change its form, and illustrates this by a diagram of the change of form and the movements (flow) of the particles of metal in an iron nut when a hole is punched through it. This flow is the same in one sense as in amalgam. But in iron, steel, gold, silver and all the metals, except tin and a few others of the soft metals, a given stress will cause a certain flow which occurs immediately and ceases within one or two minutes after the stress is applied although the stress be maintained. An increase of the stress produces an increased flow, which again ceases until there is an increase of the stress. The flow of amalgam is different in this: when the flow has begun, it continues as long as the stress is maintained. . . . It will go slowly with a light stress, somewhat quicker with a heavier stress; but it cannot be made to go very quickly with a very heavy stress; it will break into fragments.

A silver-tin amalgam is not malleable.

Contrary to Dr. Black's ideas as expressed in the above quotation, dental amalgam is subject to the same laws that govern the physical properties of all metals and their alloys. All metals and alloys of metals have, in some degree, the property known in metallurgy as "solid flow." It is a most important consideration in engineering practice, for it is a function of malleability and ductility, upon which properties depend the rolling, forging, drawing, and stamping of metals. All solid metals and alloys undergo plastic deformation when subjected to any kind of stress which exceeds their strength, therefore in Dr. Black's experiments to determine flow

in amalgams he simply exceeded the strength of the material he was testing by imposing too heavy a load; that is, he exceeded its elastic limit. A parallel is afforded by the metals bismuth and antimony, which are instantly shattered by the blows of a hammer, that is, by an overload suddenly applied, yet nevertheless they undergo plastic deformation under a lighter load, if slowly applied, which is within the limits of their moduli of elasticity, and under high pressure they have the property of viscosity, that is, they can flow out through the apertures of a surrounding mold. (See Desch, "Metallography," 1913, p. 342.)

When Dr. Black states that amalgams "are at the same time both very brittle and very ductile," and then, at the conclusion of the quotation given above, that "A silver-tin amalgam is not malleable," he is not only in error but is not capable of being understood; for ductility, the property of being able to flow through an opening under tensile stress, depends primarily upon the property of malleability. The undesirability of excessive flow under stress is conceded.

FORMULA.

At pp. 309-10, "Operative Dentistry," Dr. Black makes the following statements:

Experiments with silver-tin alloys. The next problem was to find whether or not a silver-tin alloy could be found that would neither shrink nor expand in setting when annealed to the normal state of the metal at ordinary room temperatures. . . . This line of work revealed the fact that annealed alloys of 70 per cent. or less of silver and 30 per cent. or more of tin all gave amalgams that shrank, while all containing more than 75 per cent. of silver would expand when fully annealed. From this point another short course of alloys only $\frac{1}{2}$ per cent. apart was necessary to find the exact balance which would produce an alloy that would absolutely lie still while hardening. When this was found, it was a good formula for that batch of metals, but not for another batch, for the purity might be different, and the formula for each new batch of metals had to be found. *Therefore, no fixed formula could be good for general use.*

The idea of "balancing," expressed as "balanced formula" for an alloy, and the "balancing of the expanding properties of one metal against the contracting properties of another" is the crux of the G. V. Black method of alloying. Here, again, the internal constitution of alloys is ignored. The underlying idea is exposed as an inexcusable error, for it is based upon the conception of alloys of metals as solid cold solutions, the percentages of which can be varied continuously at the will of the "rule of thumb" metallurgist, and upon the long-discarded additive theory of alloying—which is a corollary of the misconception of alloys as mere physical solutions of metals the physical properties of which are the accumulation or sum of the properties of the component metals; that is, the physical properties are present in the alloy in the same degree as they were present in the metals before alloying. It is not necessary to quote from any authority in support of a refutation of the foregoing idea, as all modern authorities treat the additive theory of alloying only as a matter of historical reference.

It has already been shown that an alloy that will lie still while hardening is impossible. The statement that a new formula is necessary for each new "batch" of metals—for the reason that chemically pure metals are too expensive for use in the manufacture of amalgam alloys—seems to be a reflection upon dentistry and is a misstatement of fact. Dr. Black speaks of silver that he used (Cosmos, 1895) that was 999 fine, and it can be easily verified that at the time Dr. Black made the above statement (1908) as to chemically pure metals not being commercially available, silver, gold, copper, tin, and zinc, chemically pure, were available. As to the unwillingness of dentists to pay a high enough price to insure the use of chemically pure metals in their amalgam alloys, it is a matter of fact that dentists have shown their willingness by having paid prices that should insure the use of such metals.

A fixed formula is recognized by scientific metallurgists to be a first

requisite in the production of an alloy of metals, for without it there can be no "fixed results." "No fixed formula" grants to an alloy-maker such latitude that he cannot be brought to book for deviations from a correct standard by checking his product by analytical methods.

CONCLUSIONS.

The writings of Dr. Black upon the subject of dental amalgam alloys are replete with contradictory statements, confusing uncertainties, and a mass of irrelevant details that obscure his subject. There is revealed a deplorable lack of information upon the physical chemistry of metals, and, in fact, upon the science of metallurgy itself.

Dr. Black completely reversed his position on the property known as "aging" of alloys, first maintaining positively that a slowed set and a reduced proportion of mercury results from an oxidation of the alloy particles in aging; then, in subsequent statements (*DENTAL COSMOS*, December 1896, also "Operative Dentistry") he says that aging should be termed annealing, an effect of heat alone which operates to relieve a condensation or hardening of the alloy particles which has been caused by the impact of the cutting tool. Had he viewed this point from the standpoint of the physical constitution of cast alloy, he would have seen that the condensation caused by the cutting tool is superficial.

Upon the subject of "formula" Dr. Black stated (*DENTAL COSMOS*, 1896) that the percentage formula, Silver 68.5, tin 25.5, gold 5, zinc 1, meets the requirements of expansion; then again ("Operative Dentistry," vol. ii, p. 309), "All containing 75 per cent. or more of silver would expand when fully annealed." This was followed by the statement that no fixed formula is possible. Then again, in "Operative Dentistry," ii, p. 312, he states that "Copper, not more than 5 per cent. . . . increased the strength of the amalgam without doing injury in other ways, and seems desirable. In my present view, it is the only modifying metal thus far

known that is desirable." Dr. Black first recommended zinc in an alloy, as is shown in the formula quoted above, then condemned it—*ibid.* p. 312, where he says:

Experiments in watching fillings for five years show also that $\frac{1}{2}$ per cent. of zinc is inadmissible for the reason that the amalgam will continue to change bulk very slowly for that time, and perhaps much longer. Though this change is not large (not more than $1\frac{1}{2}$ points per year with 1 per cent of zinc), it will finally destroy the usefulness of the filling. This effect is so subtle that it was not at first discovered.

Dr. Black gave no consideration to the direction of the expansion of amalgam, or else he would not have advised parallel cavity walls against which to pack an amalgam filling; for, as the expansion occurs at right angles to the floor of the tooth cavity, it is obvious that the filling can slide along these walls in an almost unobstructed straight line, expanding only over its free surface without exerting its general expansion, because it is moving in the line of the least resistance. If the cavity walls have a slight inward slope, a resistance is superimposed upon the expanding filling which forces it against the cavity walls. A means is thus afforded of retention for the filling, and the cavity is sealed against the ingress of bacteria.

Dr. Black discouraged the making of alloys by dentists, asserting that expensive apparatus is necessary for the purpose. He also said that all experiments prior to his own, which he considered were scientific, had been merely clinical, thus inferring their comparatively small use. This attitude must naturally have had the effect of discouraging some of those men in dentistry who could have made scientific progress in the work, as well as those whose mere empirical experiments might have added something of value.

1112 CHESTNUT ST.

[The discussion of this paper will be published under "Proceedings of Societies." next issue.]

Clinical, Roentgen, and Microscopic Diagnosis of Dental Conditions.

By KURT H. THOMA, D.M.D., Boston, Mass.

(Read before the Academy of Stomatology of Philadelphia, April 28, 1919.)

REALIZING the great progress that has been achieved in dentistry within the last five years, you will undoubtedly all agree with me that we have also added greatly to our responsibilities. Formerly we limited our work to the relief of pain and the restoration and preservation of the teeth for cosmetic effects and masticating efficiency. Any tooth which was useful was good, and every root to which we could attach a crown was saved.

Every dental roentgenologist can tell you that today, even extensive bridge work is attached to infected teeth by unscrupulous dentists without first investigating the condition of the abutments. Chronic infections and lesions which are a menace to the patient's health remain unnoticed because they give no local symptoms, and the dentist neglects to make a thorough examination, being too busy with routine work and its many intricate and complicated details.

A complete change is necessary. The routine examination with the explorer is inadequate, and the charts commonly used for recording our findings are antiquated. If patients entrust us with the care of their teeth, it is our just duty to make a thorough investigation. This pertains to private practice as well as to dental school clinics; in the latter, with the important addition of teaching the student the right way, so as to prepare him for his future responsibility.

EXAMINATION OF PATIENTS.

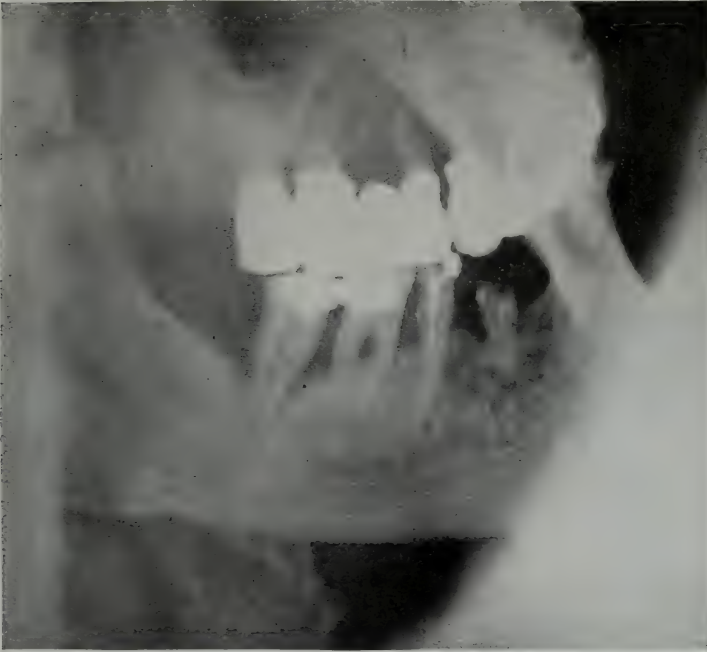
In a general way, we may say that we have two kinds of patients to examine,

those who come with a definite complaint and those who want a general examination of the mouth. It is with the first class that most of our mistakes are made. Take, for instance, the patient who wants to have one particular tooth extracted because he thinks it is the cause of some systemic disturbance; the folly of extracting this one tooth, even if it were an infectious focus, without thoroughly investigating the condition of the rest of the teeth is obvious. With the exception of occasional cases, which are usually of acute character, it is extremely unwise to jump at conclusions. The most proficient diagnosticians only seldom depart from a systematic plan of examination, and therefore it is always well to adopt a certain routine and follow it in every instance.

TAKING THE HISTORY.

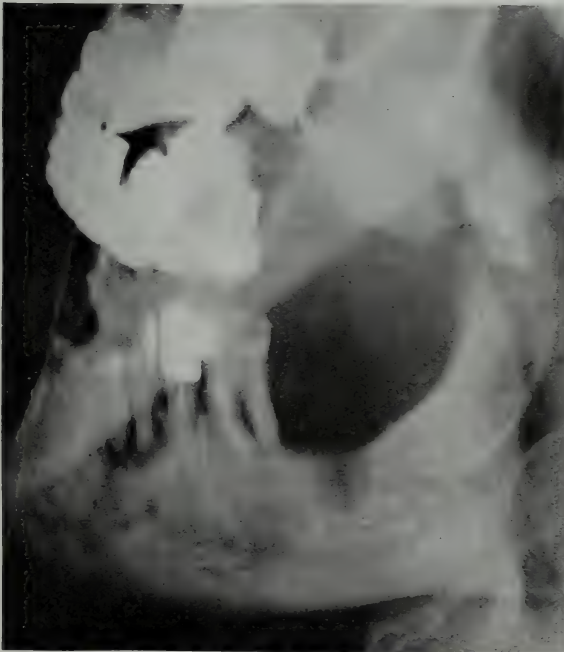
It should always be borne in mind that the teeth are not isolated organs. They are not only in close relation to other important structures, but intimately associated with the rest of the body. The mouth may be the seat of secondary lesions of general diseases, such as the eruptive fevers, tuberculosis, and syphilis, and in turn infectious lesions of the mouth may be the primary or contributory cause of somatic disturbances. In all cases, therefore, where such conditions are evident in the beginning, the history should be taken first. If patients present themselves for purely dental treatment and we find important lesions during routine examination, the general

FIG. 1.



Radiogram (Mr. W.) showing left side of mandible.

FIG. 2.



Radiogram (Mr. W.) showing right side of mandible.

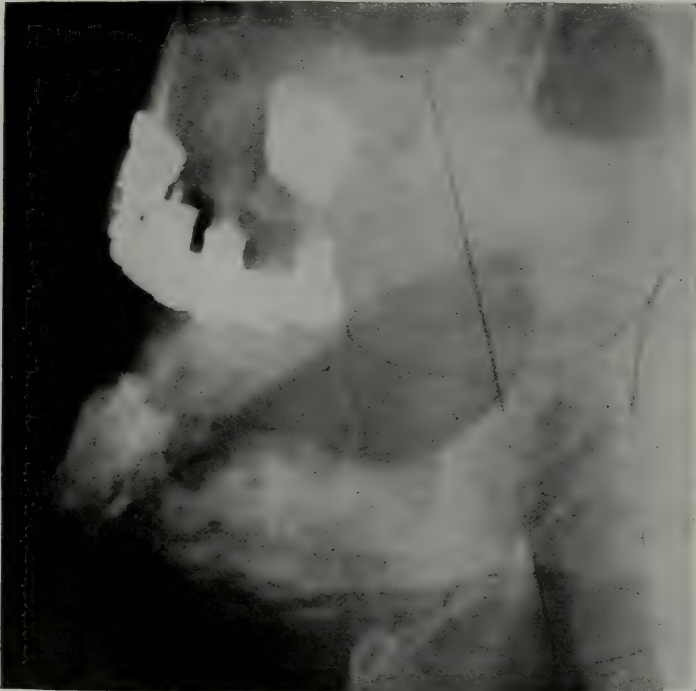
health of the patient should then be ascertained.

In taking the history, all the general conditions should first be inquired into. Consultation with the patient's physician is almost always of benefit to all concerned. If the patient has not been under treatment for the co-existing diseases, the importance of at least an opin-

and neck and numbness in the region supplied by the inferior left alveolar nerve. The entire lower jaw was tender, especially in the submaxillary region; the submental region showed marked swelling; the gum over the bicuspid had been incised. Temperature was 99.2°.

From the examination and roentgenograms (Figs. 1 and 2) the following diagnosis was made: Osteomyelitis of the mandible, espe-

FIG. 3.



Radiogram (Mr. W.) taken March 5th, showing progress of disease.

ion by a competent specialist should be proposed. Without this, a correct diagnosis is often impossible. The following case is cited for illustration:

Mr. W., age about fifty-five, married, says that he has been under treatment by a dentist in Boston for an abscessed lower left bicuspid. His physician examined him and advised to have roentgen plates taken. Patient was examined by me on February 20th. He complained of severe pain in the jaw

especially the anterior region. Almost all teeth showed periapical infection.

The teeth were extracted and drainage established. The wound was irrigated several times a day. The condition, however, grew worse. On March 5th an abscess in the submental region was incised, and 3 oz. of pus evacuated. The patient was greatly relieved and was dismissed from the hospital. The bacteriological examination showed presence of streptothrix anaerobius.

Soreness and pain, however, continued, and

roentgen pictures taken at this time (Fig. 3) showed extensive necrosis of the entire body of the mandible. I then suggested a Wassermann test, which was decidedly positive. The diagnosis was at once followed by salvarsan treatment and resulted in speedy improvement. Roentgen pictures taken in July show almost normal condition, and the patient has since had no disturbance whatever.

The lesson to be learned from this case is that nothing must be taken for granted, and although this patient came from a physician of great reputation, a Wassermann test should have been insisted upon at the beginning. This would probably not have affected the local treatment to any great extent, but would have led to earlier specific treatment, with speedier recovery as a result.

The history of the *local condition* is obtained next. Symptoms should be inquired into, their onset and character should be noted; the present conditions and previous treatment should also receive proper consideration.

INSPECTION OF THE MOUTH.

Inspection of the mouth is the first step in local examination. The condition of the teeth is noted first. The teeth are either healthy, neglected, or show signs of more or less dental work of good or poor character. All discolored and crowned teeth and those with large fillings should receive more careful attention later.

The lips and cheeks are next retracted with the mouth mirror or special retractor to examine the condition of the gums. Inflammatory changes, swellings, and sinuses are noted. Their character may be further studied by palpation. Secretions may be pressed out from the gum margins if pus pockets are present, or from the opening made by a partly erupted third molar. A painful sensation is often evidenced by the patient if pressure is applied with the tip of the finger on the gum overlying the apex of a tooth which has a blind abscess. The hard and soft palate and palatal part of

the gum receive attention next, as well as the floor of the mouth, the lingual part of the gum in the lower jaw and the tongue. Small lesions of the tongue should always receive attention, as they may be the beginning or indication of very serious conditions.

In a child, we should in addition study the occlusion of the teeth, the profile and the facial lines, the position of the head, the width of the face, jaws, nose, and nares. Some of these conditions are also to be considered in the adult if restorative work is contemplated.

The lymph glands when swollen are important practical indicators. If they are enlarged, but soft and tender, they usually point to an acute infectious process, while in chronic diseases they are usually large, hard, easily palpated, and not tender to touch. Examination is made on both sides at the same time for the sake of comparison. The patient holds the head in a downward position with the muscles of the neck relaxed. The submaxillary and sublingual lymph glands cannot be felt when in normal condition.

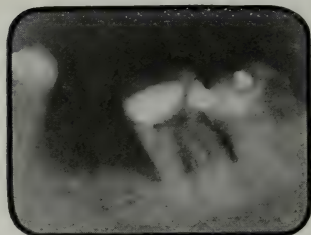
While this ends the inspection of the tissues we are more strictly concerned with, it is always desirable to have a look at the throat and tonsils. If the symptoms indicate it, or if periapical infection exists on the upper bicuspids and molars, we should also transilluminate the sinuses.

ROENTGEN EXAMINATION.

It is almost impossible to thoroughly examine the mouth without the use of the roentgen ray. But let us not forget that this method does not replace all other means of diagnosis. There are unfortunately still some dentists who belittle the value of a roentgenogram, and to them it should be pointed out that the roentgen ray gives accurate and exact records of the comparative radiability of tissues, but does not picture disease. The value of the picture depends on its correct interpretation, and correct inter-

pretation can only be made from a good roentgenogram. It is my opinion that more harm than good has come from the many cheap roentgen machines that have been put on the market lately—I judge from the many poor pictures which reach my hands and which are absolutely useless for diagnostic purposes. The roentgenologist must have exact knowledge of the normal anatomy of the part under consideration, and must be well trained in pathology to interpret correctly the picture of structural changes. Finer pathologic conditions such as seen under the microscope cannot be recognized,

FIG. 4.



Radiogram (Miss. B.) showing cavity at distal side of first molar and changes in the bone around apex of distal root, indicating pulp disease.

but grosser pathology is visible by changes in the outline or radiability of the tissue. The roentgenologist must also learn to draw correct deductions and become proficient in associating typical roentgen signs with corresponding disease conditions.

The following case illustrates this point:

The patient, Miss B., had been suffering from a so-called neuralgic pain for several weeks. None of the teeth were sore. The lower left first molar reacted about normally to heat and cold. The pain was gradually getting worse. The patient had several roentgenograms taken, which according to her story showed no trouble. After taking an extra-oral plate, I found three distinct conditions any one of which might have been the causative factor.

Films were taken for finer detail, and finally I decided the condition of the lower left first molar to be the cause. The roentgenogram (Fig. 4) showed a cavity at the distal side of the distal root well under the gum. At the apex of this root was a radiolucent area.

The conclusions drawn from these findings were: Tooth shows no evidence of root-canal work—pulp tissue therefore had not been removed. Process of decay reaching close to pulp. Radiolucent area at apex a sign that periapical tissue has become involved, from which I deduced that the pulp was in a state of chronic inflammation.

Roentgen examination is the only means of investigating the condition of root-fillings, devitalized teeth, unerupted and impacted teeth. It is often of great value in making a differential diagnosis, such as between pyorrhea and diffuse osteomyelitis of the jaw, tumors, dentigerous and periodontal cysts. The location of foreign bodies, sequestra, and salivary calculi is greatly aided by the roentgen method, especially by the stereoscopic one. In the search for infectious oral foci and etiologic factors in neuralgia the roentgen ray is indispensable. A plate of the sinuses should always be secured if symptoms or abscessed teeth in the upper bicuspid or the molar region give suspicion of their involvement.

In obscure conditions, extra-oral plates should first be taken to get a general survey of the region involved. Without them, malposed teeth, large cysts, infections of the ramus and diseases of the sinuses are frequently overlooked, because many times they cannot be included in the small dental films. The intra-oral films, however, show detail conditions of the teeth and alveolar structure with greater accuracy, for the simple reasons that they can be brought closer to the subject, and because there is less distortion and superimposition of shadows. Sometimes it is necessary, however, to take several pictures from various angles to obtain accurate information. Whatever the roentgen picture shows is a truthful reproduction, but

quite frequently, on account of faulty technique or size of film, we do not find all that exists.

Another case is cited for illustration:

Miss G. had suffered dull pain in the lower jaw for seven years. No one could find the cause. Later, numbness supervened, together with a bad taste in the mouth. Several X-rays were taken by private dentists and

INSTRUMENTAL EXAMINATION.

After inspecting the oral tissues and securing roentgen pictures of teeth and adjacent parts, instrumental examination should be made in the ordinary way by means of explorers, and all suspected devitalized teeth, of which the roentgen picture gives no definite information,

FIG. 5.



Radiogram (Miss G.) showing large cyst including almost the entire ramus.

in an infirmary, without discovering the cause. An extra-oral roentgen picture (Fig. 5) was taken, and a large radiolucent area was seen in the ramus, surrounded by a light line. A very dark but small area was observed in the postmolar triangle. Diagnosis was made of periodontal cyst including almost the entire ramus. The cyst was infected and involved the inferior alveolar nerve, degeneration of which caused the numbness. The small round spot proved to be a perforation through which pus was discharged at times, causing the bad taste in the mouth.

This goes to prove that an accurate extra-oral picture and its correct interpretation are essential in obscure cases.

should then be tested by the heat and cold tests or the faradic current.

It is a great mistake to rely exclusively on a roentgenogram for diagnosis; clinical information will be found a great help in the interpretation of the roentgen picture.

MICROSCOPIC EXAMINATION.

Pathologic discharges should be examined microscopically, and bacteriologic cultures often give further important information. Sections are often of great help to differentiate between be-

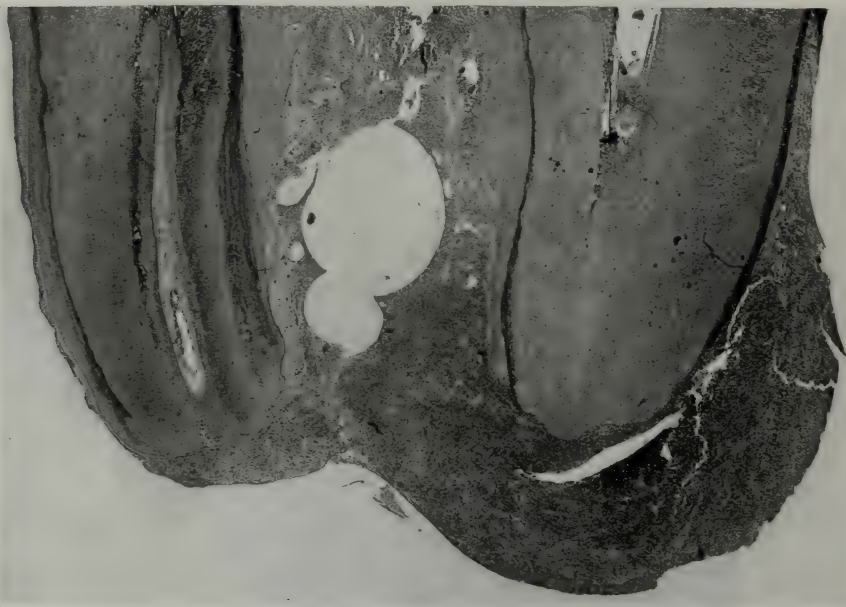
nign and malignant tumors, and are important in determining how extensive an operation is necessary.

Histological study of the diseased tissue is not only interesting from a scientific point of view, but of real practical value, as it forms the foundation upon which we should base our methods of medical as well as surgical treatment. When we study pathologic sections, the

tion of such a tooth under the microscope, we cannot fail to read the handwriting of nature. It shows the same process as in necrosed bone—a slow but persistent absorption which leaves no doubt as to nature's ultimate intention, namely, elimination. (Fig. 6.)

Another condition which is sometimes misunderstood is the persistence of nerve fibers in infected pulps—the so-

FIG. 6.



Photomicrograph showing apices of a lower molar with blind abscess or granuloma around both roots. No absorption of the hard tooth substances.

necessary procedure to restore normal, healthy conditions is at once evident. Take, for instance, the question of the treatment of a blind abscess, such as granuloma; if the peridental tissues and the hard structures at the apex of the tooth have remained normal, all that is necessary is the sterilization and proper aseptic filling of the root-canal. If, however, the cementum is denuded and pus-soaked, forming an obnoxious foreign body, which histologically is evidenced by osteoclastic absorption, healing cannot occur unless this necrosed tissue is removed. If we examine a sec-

called "dead pulp," which still reacts to the various tests of temperature and electricity. Such a case has been described and illustrated in Fig. 4. A similar case, also causing neuralgic pain, in which the tooth was extracted, decalcified, and cut for sections, is seen in Fig. 7. Note the infection and the persisting nerve fibers, pressed to one side by the tissue abscess.

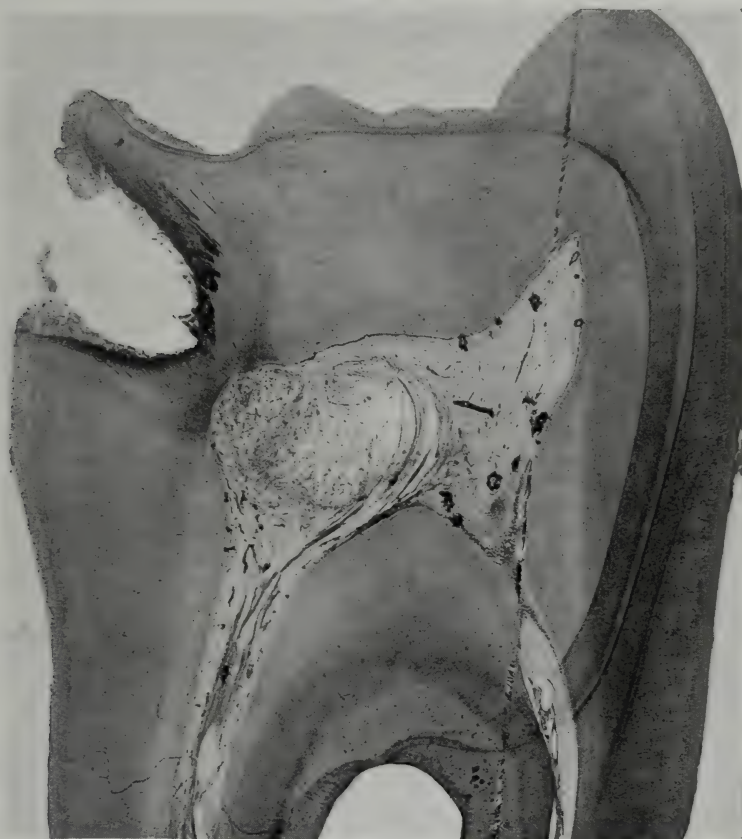
RECORDING THE EXAMINATION.

It is evident that the examination charts which have been in common use

during the last few years are not practical for recording a complete examination such as suggested. To my knowledge there is none in the market at the present time which would fill every need. A practical card should show pictures

card, on which there is space for the history and record of the successive treatments. A second card is used for a chart on which the conditions of the teeth are recorded. Both crown and roots are outlined, so that not only cavi-

FIG. 7.



Photomicrograph of a lower third molar with cavity, from which infection extended through the dentinal canals to the pulp. Pulp abscess in the side of the pulp chamber, causing pressure on nerve fibers which are still intact.

of the teeth, crowns as well as roots, should have space for the history, and should be arranged so that films and written matter can be easily attached. In my own practice I use an envelope, on which the patient's name and address is printed, with the accounting system underneath. Inside is the examination

ties and fillings can be indicated, but also root-fillings, periapical conditions, pus pockets, and sinuses. Roentgen films, reports of consultations, and any other matter pertaining to the case can be included and kept together. This saves a great deal of time when it is necessary to look up any detail of a case.

SPECIAL DIAGNOSIS AND PROGNOSIS OF
ORAL LESIONS IN CONNECTION WITH
SOMATIC DISEASES.

No one today will dispute the fact that conditions may be present in the mouth from which *acute* general infection can result. The discovery that an infectious focus may be the source of entirely different conditions from those observed in acute general sepsis still finds obstinate resistance in some quarters. Bacteriological studies and animal experiments, however, such as undertaken by Rosenow, Hartzell, and others support this theory, and a thorough study of an abundant number of carefully observed clinical cases has proved without doubt that infectious lesions in the mouth may be the cause of a large number of somatic diseases. I could cite from my records case after case in which the eradication of a septic focus in the mouth brought about most gratifying results.

It is, however, a mistake to spread the impression that the oral foci play a predominant part in systemic infection. They are no more important than are diseased tonsils, infected sinuses, gastro-intestinal auto-intoxication, or genito-urinary diseases, and careful study of the history and painstaking general physical examination are of greatest importance.

The result of the removal of the focus depends entirely upon the nature of the general disease. By the removal of a focus the absorption of toxin is stopped entirely and therefore conditions due to toxemia can be easily eliminated. When, however, a large amount of tissue has been destroyed in some other part of the body from metastatic infection, it would be unreasonable to expect marked improvement from the removal of the focus alone. But any pathological condition due to bacterial infection, even if it is not the primary focus, is a contributory cause. The perfectly healthy patient is usually able to take care of small amounts of septic absorption; but the same condition may cause considerable harm in a chronic invalid, whose natural resistance is lowered. As an illustration,

let us study the effect of a vaccine on a patient with a strong heart and on one with a weak heart:

The first patient (hosp. case No. 225), a woman, age fifty. A well-developed and well-nourished woman, she had been suffering from chronic arthritis for twenty-one months. Lungs normal; heart sounds regular and of good quality. On February 20th, vaccine treatment was begun. Injection of 75,000,000 typhoid bacteria with 100 cc. of normal salt solution was made at 3.30 P.M. into the median basilic vein. She had a definite chill which lasted twenty minutes, but otherwise there were no heart symptoms. Temperature and pulse curve shown on chart (Fig. 8, A). By 9.30 P.M. these were perfectly normal. A second vaccine treatment, of 100,000,000 bacteria, given eight days later, gave a similar result.

The second patient (hosp. case No. 211), a woman, age thirty-six, was admitted for chronic arthritis. Had had measles, diphtheria, and scarlet fever when a child: at the age of twelve, "St. Vitus' dance," which lasted two years; two attacks of pneumonia when fifteen years old, and rheumatic fever seven years ago. Her present illness began eighteen months ago, when she noticed pain and stiffness in the knees. Joints of fingers, elbows, and shoulders are now involved. Present examination shows slight edema in ankles, teeth poor, glandular enlargement in submaxillary region on both sides. There was a systolic murmur in the heart, but no evidence of physiologic disease. On February 15th, at 4.15 P.M., this patient received a vaccine injection of 75,000,000 bacteria intravenously. At 5 P.M. there were signs of reaction, chill, typical spasmodic shaking, but no complaint of cold. Had marked cardiac symptoms at 9 P.M. Patient was dyspneic, cyanotic and coughing. Sputum was salmon-colored. Distress, dyspnea, and headache lasted until about midnight, and the next day there was still tenderness and palpitation over the precordia. (Fig. 8, B.)

Observations of this kind teach us that no general rule can be applied, and that each case must receive careful individual consideration. All conditions should be summed up before we can decide how radical the treatment should be. The prognosis depends entirely on the seriousness of the general disease and the extent of the local condition. If the result of the examination points toward

the mouth as being closely related with the somatic disease, or if the teeth can be removed without seriously interfering with the prospects of a comfortable mechanical substitute, a radical procedure is advisable. On the other hand, if a patient has other sources of infection, which may be equally important or, ac-

careful and frequent examination, a great deal can be accomplished in the discovery of disease, be it decay, pyorrhea, or other affections, before irreparable harm has been done. This especially applies to children, both in our practice and schools, and we shall find that the coming generation is going to

FIG. 8.

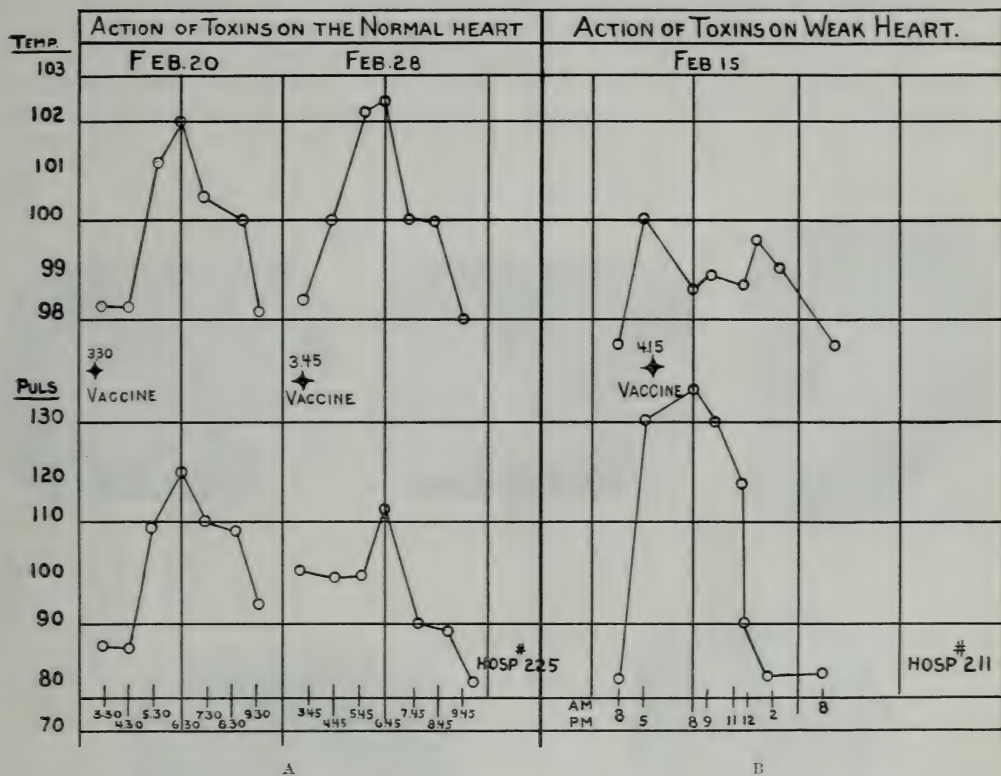


Chart of hosp. case No. 225.

Chart of hosp. case No. 211.

cording to the history, more responsible, we should eliminate these first, especially if but slight evidence of pathological conditions be found in the mouth.

The question of what the treatment should consist of, whether it should be surgical or medicinal, is not within the scope of this paper; but I cannot close without emphasizing the most important duty of the dentist, which is *prevention of infection*. By the teaching of proper hygienic measures, laying stress upon

develop healthy teeth, requiring only in exceptional instances the removal of the pulp and its attendant difficult and uncertain consequences. This will not only solve a great many of our present problems, but must prove a great benefit to humanity.

43 BAY STATE ROAD.

[See also *Discussion*, as reported under "Proceedings of Societies," this issue.]

Sinusitis: Its Relation to Abscessed Teeth.

By F. G. ROLLINS, D.M.D., Boston, Mass.

THE following case was referred to the writer by one of Boston's prominent nose-and-throat specialists. The facts in connection with the case from examination to completion are as follows:

in the cause of the condition, and the usual remedies had been efficiently applied before consulting an oral surgeon. For two years the patient had undergone medical treatment every day, which consisted of probing and packing the sinus,

FIG. 1.

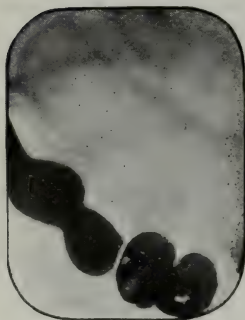


FIG. 2.



FIG. 3.

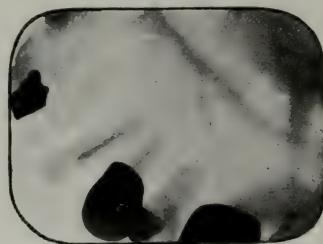
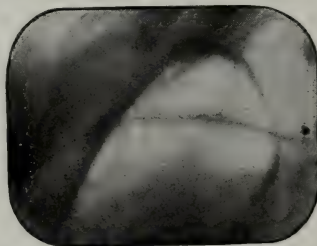


FIG. 4.



FIG. 5.



HISTORY OF THE CASE.

Some two months ago, a patient, age twenty-eight, came to my office for treatment, the specialist referring her having diagnosed the case as sinusitis. The difficulty did not lie in the diagnosis, but

but resulting in temporary relief only. The sinus discharged continually and was accompanied by a headache, pain through the eyes, sensitiveness upon pressure of the nose in the infra-orbital region and resulting in continuous nervous irritability, the headaches being so

severe at times as to border upon mental disturbances. Concentration of the eyesight, such as in attending the theater and as the effect of travel, aggravated the case to an intensified degree and added to the great discomfort of the patient in the form of extremely severe headaches.

EXAMINATION.

On upper left side. Central incisor, porcelain crown. Lateral gold crown. From cuspid to second molar, bridge work—the cuspid, second bicuspid and second molar being used as abutments. First and third molars absent. (Figs. 1 and 2.)

On upper right. Central, lateral, and cuspid carious and sensitive, as well as gingiva over root apices. First bicuspid gold crown, also first molar. Second bicuspid and second molar carious and sensitive, and gingiva also sensitive. Third molar malformed but in normal position. (Figs. 3 and 4.)

On lower left. First bicuspid badly broken down, showing advanced stage of pyorrhea, also second molar involved. Second bicuspid, first and third molars missing.

On lower right. Second molar loose, advanced stage of pyorrhea present, both bicuspid and first molar missing. Six lower anterior teeth in good condition, with the exception of a slight tendency toward pyorrhea.

RADIOGRAPH INTERPRETATION.

Superior left central, suspected root perforation; cuspid tooth, slight area; lateral tooth involved; second molar pathologically involved; atrophy about the root apex. Superior right central, lateral, cuspid, and second bicuspid pathologically involved, with abscess on first bicuspid, also a tendency of the process to thicken and atrophy about the root apex. Inferior teeth—no radio-

graphs taken, as objective symptoms were self-evident. Antrum clear, according to X-ray and transillumination examination. (Fig. 5.)

SYMPTOMS AND DIAGNOSIS.

All teeth of the upper jaw sensitive to occlusion and percussion, especially the right superior central, having been sensitive for over a year. Gingiva inflamed and dark red. Diagnosis: Frontal sinusitis, due to infected teeth.

TREATMENT.

All the superior teeth were extracted, together with the first bicuspid and second molars of the lower jaw. For extraction of the upper teeth, maxillary tuberosity and infra-orbital injections of novocain were used, with slight infiltration about the bicuspid. The lowers were extracted under mandibular injection anesthesia. The tooth sockets were thoroughly eurented.

Results. On the following day the patient presented for post-operative treatment and reported that the headache had ceased completely, for the first time in two years. Three days later the sinus had stopped discharging, and the accompanying pain in the eyes had disappeared. A week later the frontal region was pronounced clear by the specialist who had referred the case to me.

CONCLUSION.

The writer believes this case presents further evidence of the established fact that in all cases of physical disturbance caused by difficulty in the oral cavity, the welfare of the patient is best served and the efficiency of the medical and dental profession best maintained by a close professional co-operation between the physician and dental surgeon.

29 COMMONWEALTH AVE.

PROCEEDINGS OF SOCIETIES

Northeastern Dental Association.

Twenty-fourth Annual Meeting, at Providence, R. I., November 21-23, 1918.

THE twenty-fourth annual meeting of the Northeastern Dental Association was held on Thursday, Friday, and Saturday, November 21, 22, and 23, 1918, at the Hotel Narragansett, Providence, R. I.

THURSDAY—*Morning Session.*

The meeting was called to order at 11 o'clock by the president, Dr. Ira B. Stilson of Providence, R. I.

Dr. DAVID MANSON, Burlington, Vt. In view of the fact that the minutes have been published and distributed to the members, I move that the reading of the same be dispensed with. (Motion carried.)

Dr. A. A. HUNT, Hartford, Conn. The Board of Censors have recommended to the association the adoption of the following suggestions by our former president, Dr. Manson, in his address at Worcester, Mass., in 1917:

That the name of this association be changed to "The New England Dental Society." That we endeavor to have our meetings more interesting and of a higher caliber.

The secretary, Dr. Hunt, also read a list of applications for membership, which had been approved by the Board of Censors.

On motion of Dr. LOCKWOOD, the report was approved and placed on file.

REPORT OF THE SECRETARY.

Dr. A. A. HUNT. I have no report to make except that this year more than

any other we have had a great many programs returned on account of faulty address, and I wish to impress on you the necessity, in making a change of address, to notify the secretary immediately.

On motion, the report of the Secretary was accepted.

REPORT OF THE TREASURER.

Dr. ROY A. BUSH, Worcester, Mass., read his report as Treasurer, the same having been audited and approved by Dr. Charbonnel and Dr. Lockwood.

PROVIDENCE, Nov. 15, 1918.

Receipts	\$4,194.22
Expenditures	2,224.89

Balance	\$1,969.33
---------------	------------

Of the balance on hand \$1500 is in Liberty bonds and \$469.33 in cash.

On motion, the report was approved and placed on file.

THE PRESIDENT. Your president felt the time could be more profitably spent listening to the essayists and the instructors we have secured, than listening to an address by him. Our time is short, and we have a great deal of valuable matter to present, and therefore I felt we could dispense with an address.

Under the head of "unfinished business" will come the change of name of the society, as recommended by the committee appointed for that purpose, and approved by the Board of Censors. This is an amendment to the constitution pre-

sented to the last meeting in Worcester on the recommendation of Dr. Manson, our former president. The name was recommended to be changed from the Northeastern Dental Association to the "New England Dental Society."

After some discussion motion was made and carried that the name "New England Dental Society" be adopted by the association.

Dr. HUNT. As to the other change—our meetings being of a higher caliber—the committee has already taken that up at this meeting. The idea was to eliminate promiscuous clinics and get the best men of the country to come here and talk to you, rather than fill the meeting with a number of local essayists and clinicians. With the move under way now, I think the Northeastern has a good deal to expect from the future. The men are very enthusiastic. Your first vice-president especially is very enthusiastic over the plan. The idea was to make our meetings more of a postgraduate course, getting prominent men here to devote a whole day to important subjects.

Dr. DAVID MANSON, Burlington, Vt. Dr. James McManus of Hartford, Conn., was the first president of this society. In 1869—forty-nine years ago—he was the president of the Connecticut Valley Society, indicating a very exceptional career in our profession. Dr. McManus, by reason of his high ideals and his unusual interest in the affairs of this society, has endeared himself to its members during a long period of years, and it is only because of advancing age that Dr. McManus is not able to take the active part in this organization that he has in past years.

In view of the esteem in which Dr. McManus is held, I move you that a telegram of greetings and good wishes be sent to Dr. McManus at his home in Hartford.

Motion unanimously carried.

Dr. McMURRAY of Fitchburg, Mass., moved that the remainder of the business for the present session be suspended until called for by the chair.

The motion was carried.

THE PRESIDENT. There have been numerous suggestions made from year to year as to how we could best use our funds. It is the opinion of the chair that the dues are paid into this association for our advantage, and your president felt we would be justified in using our entire year's receipts, if necessary, to give you a program, if the program were worth the money. It has been our endeavor this year to produce a program which, while a radical change from the past, we feel is filled with meat and is of a kind the dentists are looking for. There is only one speaker on the program for today, and one for tomorrow, as you will notice. The man who will talk to us today, on the subject of root-canal treatment, is a man who thoroughly understands this subject, and if we can spend the entire day with him we shall be well repaid. Tomorrow we shall devote the entire day to another interesting subject. Saturday's program is also a very profitable one, and it will be added to very materially.

It is Dr. Crane's plan to take three-quarters of an hour or an hour, and then give us a little time for relaxation. It is with great pleasure I introduce to you Dr. ARTHUR B. CRANE of Washington, D. C., who will talk to us on "Root-canal Technique."

[Dr. Crane's lectures will be published in a series of articles in the DENTAL COSMOS during the year 1919, and for the reason that the series is now in course of preparation for publication, they are not printed here.—Ed.]

The meeting adjourned to 2.30 P.M.

THURSDAY—*Afternoon Session.*

The meeting was called to order by the president, Dr. Stilson, at 2.30 P.M.

Dr. Crane continued his presentation, showing many slides to illustrate his paper.

The meeting adjourned to 8.30 P.M.

THURSDAY—*Evening Session.*

The meeting was called to order by the president, Dr. Stilson, at 8.15 o'clock.

Dr. Crane continued his lecture and the presentation of lantern slides to illustrate the same.

Dr. Crane next answered the questions contained in the Question-box, as follows:

Q. What do you think of the Pentz sterilizer?

Dr. CRANE. I do not believe there is any sterilizer made that will sterilize cotton dressings in one minute. I have never made any extensive experiments in testing the various sterilizing equipments, but I have talked a good deal with men who have, and in making the rounds of various hospitals recently to investigate their sterilizing equipment, I found that they were not satisfied with sterilization of cotton and dressings—in any hospital—unless they had been subjected to steam at 15 lb. pressure for at least twenty minutes. I do not think you can get 15 lb. pressure with the Pentz sterilizer, and if not, I would not care to sterilize with it.

Q. Do you consider immediate root-filling advisable?

Dr. CRANE. Immediate root-filling should only be done in the absolute certainty of absence of infection. If you take a pulp out of a perfectly normal root, and use an aseptic technique, you can fill the root immediately, but not otherwise. In filling the root of a tooth of that character I would rather have the filling go not quite to the end than go through the end.

Q. How would you proceed to treat an upper central root which has been punctured on the labial side of the root and having an abscess, with the intention of saving the tooth?

Dr. CRANE. The location of the puncture would be the deciding factor. As a general proposition I would say, any tooth that is punctured should be treated with the extracting forceps. Sometimes,

however, it happens that the puncture is down in the coronal third, and if this can be reached and the area sterilized by means of electrolytic medication, and a negative culture can be gotten *through* the puncture and the root-ends, then the puncture may be sealed with copper amalgam; but teeth with punctured roots are almost hopeless.

Q. Do you use any medicament in the pulp chamber, or seal in for any length of time a medicament before entering canals with Rhein picks, to prevent forcing infection ahead?

Dr. CRANE. I made the statement this morning that I sealed in a 10 per cent. solution of oil of clove for three days prior to opening the root-canal, and if the pulp chamber was not open, or the root-canals occluded with previous filling material, formocresol might nicely be used—it is a wise precaution. I do not always do it. Because of the exigencies of time in a busy practice it is sometimes necessary to open into canals immediately; but where you do, never make the attempt to enlarge the canal, or go to the extreme end. Simply open the orifice, and then put in some antiseptic until the next sitting.

Q. On how many teeth do you place the rubber dam in treating an upper sixth-year or twelfth-year molar?

Dr. CRANE. That depends on the location of the cavity of entrance. Generally with the upper first molar I include the two bicuspsids. Sometimes, if the cavity is distal in the molar, I put the clamp on the second molar and include the first molar and bicuspid.

Q. How deep would you curet on extracting a superior central the upper half of whose root had been absorbed and bone apparently filled in?

Dr. CRANE. I would curet in every case until the resistance of the tissue to the curet led me to believe I was in sound bone structure. One who has done considerable bone surgery can feel the difference between healthy and unhealthy bone. I cannot say how far, any more

than by the knowledge one gets from working in such cases, aided by the sense of touch.

Q. What is your method of treating a putrescent pulp?

Dr. CRANE. I do not know that I can answer that question briefly. Perhaps the questioner desired to know, if a tooth presented with a putrescent pulp in the canal, whether I would immediately proceed to remove the contents of the canal, or not. I would not; I would open the orifice of the canal, and sometimes I put in a small pledget of cotton with an antiseptic over that, and then fill the tooth with temporary stopping and make a small puncture through that into the antiseptic-saturated cotton. I do not think any organisms would get into that pledget of cotton within twenty-four hours, to add anything to the complications already there; and if gases formed they would escape through the pin-prick puncture and prevent congestion.

Q. How do you know when you have passed the finest Rhein pick to the apex?

Dr. CRANE. You do not know it, but the patient does, and he soon tells you. You get a sensation of pain when you get to the apex. The pain is the guide which tells you when to stop.

Q. How do you know whether there is a particle of nerve tissue there, or whether you have gone through the end?

Dr. CRANE. That is something you do not know in some cases. If you use a very fine apexographer, it will catch. If you are in nerve tissue, it will not catch. Another test is to put a diagnostic wire into it, and take a radiograph.

Q. Is the dentist in the small town, without means of making all these tests, ever justified in attempting root-canal work? What is to be the solution?

Dr. CRANE. That brings up the collateral question: "What does the dentist in the city do, whose *clientèle* consists of the submerged third of the people, who under the present circumstances

find it hard to get food and clothing?" How is he to spend three, four, or five hours on this work without hope of recompense for his work? If some of you wealthy gentlemen in New England—philanthropists—wish to do this for the poor, you will be benefactors of mankind. Unfortunately, none of the wealthy dentists so far have seen fit to do it. Often men are practicing in districts where there is no electricity, where the radiograph is not available, and have to do the best they can. I said this morning that an ordinary gas stove makes a very good sterilizer for cotton and dressings; and if one has not a gas stove, an oil stove will do, or even a coal range.

There is no reason for doing sloppy work because you live in the country. You can still sterilize your field, and you can to a reasonable extent spend sufficient time to get your canal properly opened, and do your best to treat it. We can place no dependence on clinical evidence that the bacterial growth has been rendered inert; but my experience with practitioners in small towns is that most of them know a great deal more than the average practitioner in the large town, and I have an idea that a physician will be found who makes bacterial investigations for his own work, and he will be glad to help out his income by helping you.

Poor people in the city cannot have the same treatment as rich people. Until we have established in our cities infirmaries where poor people can get treatment for what they can afford to pay, or for nothing, they will need to have their teeth extracted to a large extent, because if you are working for that class of people and charge them fifty cents for treating a tooth, and you leave an area of infection there which may ultimately result in their death, you have not earned the fifty cents—you have cheated your patient, and it will do him more harm than good. Much better take your forceps and extract the tooth. That patient cannot have a removable bridge, either; he must have a plate.

Dr. BLIVEN moved a vote of thanks to the essayist. The motion was unanimously carried.

The meeting then adjourned to 9.30 A.M. Friday.

FRIDAY—*Morning Session.*

The meeting was called to order at 10.30 o'clock, by the president, Dr. Stilson.

The Secretary read the following resignations, which had been acted on by the Board of Censors: A. L. Miles, G. F. Murdock, E. O. Blanchard, G. M. Somers.

Also the following resignations, to be acted on by the society: M. E. Peirce, Cambridge, Mass.; E. J. Roberts, Augusta, Me.; Edgar H. Minot, Biddeford, Me.

Dr. MEAD moved that Dr. Roberts, who has been a member of the society for many years, be made an honorary member. (Motion carried.)

Dr. WILBUR moved that when Dr. Roberts is made an honorary member his dues be remitted. (Motion carried.)

Dr. POND moved that the resignations be accepted. (Motion carried.)

The Secretary read a communication from the vice-president, Dr. Blake A. Sears, who was in France.

Dr. POND moved that the secretary send a message of greeting to Dr. Sears from the society. (Motion carried.)

The Secretary read a communication from Dr. Marion L. Woodward, in reference to making honorary members of those who had been members of the society for twenty-five years.

Dr. CHARBONNEL moved that the communication be referred to the Executive Committee for action. (Motion carried.)

Dr. MEAD moved that a committee be appointed to draw resolutions of regret on the death of Dr. Geo. A. Maxfield, our former president, Dr. Chas. H. Gerrish and Dr. Clinton N. Williams, and that the condolences of the society

be sent to their families. Also that a message of sympathy be sent to our member, Dr. Dowsley, on account of his recent illness. (Motion carried.)

The President appointed Drs. Bush, Pond, and Gould as such committee.

THE PRESIDENT. It is with great pleasure that I am able to present to you the son of one of the most admired men I have ever come in contact with. We do not always find the glory of the father resting on the son, but in this instance we are glad to welcome the son of the man we sat under for our teaching, and whom we so much admired. I present to you Dr. NORMAN S. ESSIG of Philadelphia, who will read a paper entitled "Classification, Selection, and Arrangement of Lost Organs of Mastication."

[This paper was in substance practically the same as that by Dr. Essig published in our December 1918 issue, at page 1108.—Ed.]

The President made some announcements, and appointed the following as the Nominating Committee: Dr. Smith, Vermont; Dr. Roberts, New Hampshire; Dr. Erbe, Connecticut; Dr. Mead, Maine, and Dr. Farnum, Rhode Island.

The meeting then adjourned to 8 P.M.

FRIDAY—*Evening Session.*

The meeting was called to order by the president, Dr. Stilson, at 8.30 o'clock.

[Continuation of Dr. Essig's lecture.]

REPORT OF THE NOMINATING COMMITTEE.

Dr. Smith reported that the Nominating Committee presents the following nominations:

President—Wm. R. Pond, Rutland, Vt.

First Vice-president—Blake A. Sears, Hartford, Conn.

Second Vice-president—Leroy M. S. Miner, Boston, Mass.

Secretary—Alvin A. Hunt, Hartford, Conn.

Assistant Secretary—Leslie A. Spelman, Hartford, Conn.

Treasurer—Roy A. Bush, Worcester, Mass.

Librarian—E. A. Charbonnel, Providence, R. I.

Editor—F. H. Mead, Bangor, Me.

Dr. BLIVEN moved that one vote be cast by the secretary for the nominees, as read, excluding the secretary, and that the president cast one vote for secretary. (Motion carried.)

The ballots were cast, and the nominees declared elected.

Dr. BUSH moved that the society extend a rising vote of thanks to Dr. Essig for his very helpful and instructive paper.

The motion was carried.

The meeting then adjourned to 9.30 A.M. Saturday.

SATURDAY—*Morning Session.*

The meeting was called to order by the president, Dr. Stilson, at 10 o'clock.

THE PRESIDENT. Major Brown was to speak at 10 o'clock, Dr. Miner following Major Brown. Last evening Major Brown received orders from headquarters to report in another part of the country, so will not be able to be with us. I very much regret to announce this, for there are many of us who wanted to hear him, and some probably came here expressly to hear him; but we must submit to the authorities, of course.

The next item on the program was an address by Mr. HARRY PARSONS CROSS on the work of the Y. M. C. A. at the front.

Dr. Pond presiding.

Dr. POND. We have with us a well-known oral surgeon, who has been elected to one of our important offices. I take pleasure in introducing Dr. LEROY M. S. MINER of Boston, who will speak on "The Interpretation of Radiographs as a Basis for Oral Surgical Procedure."

The Interpretation of Radiographs as a Basis for Oral Surgical Procedure.

By Dr. LEROY M. S. MINER, Boston, Mass.

We are all full of this war subject, and in turning from that to more technical subjects we perhaps lose some interest; and yet the subject we have in hand I hope will be interesting to you. I feel tremendously impressed with its importance at this time.

I dislike to bring the personal element into my talk, and yet it makes it more graphic to illustrate some of the cases. The reason I consented to speak here at the invitation of your president, was because a number of these cases have come to me within ten days. A woman came in suffering from a severe attack of neuralgia on the left side. X-rays had been taken, and a diagnosis made of an impacted upper third molar. Surgical interference was advised, and hospital arrangements had been made, but through the persistence of the family a further consultation was had, and they asked me to see the patient with the X-ray. The X-ray showed a shadow astonishingly like a tooth back of the second molar, but which on careful examination proved to be the tip of the coronoid process of the mandible!

These misinterpretations are not always made by men who are just beginners in X-ray work. This particular case had been diagnosed by one who should have known better. I am not saying this in a spirit of criticism, because we all make mistakes; but I want to illustrate the importance of correct diagnosis. If this poor girl had been sent to the hospital and etherized with the intention of taking out a third molar which was not there, you can see what serious consequences there would be. It is astonishing how often that tip of the coronoid process appears in the place where the third molar should be; when the picture is taken at the correct angle this tip is where it should be, but it is astonishing how it appears in the X-ray. We must be careful in making our diagnosis.

The second structure very frequently misdiagnosed is the mental foramen; it is often mistaken for a pathological condition. It is surprising that this should happen, but only last week a patient was sent to me who had a sinus on the cheek which had persisted for some time, opposite the bicuspid. An X-ray had been taken, and a diagnosis was made of an abscess on the first and second bicuspid and an area of necrosis below. The area so carefully marked by an arrow on the picture was simply an irregular mental foramen. It was clearly demonstrated by the removal of the infection in the first bicuspid; the sinus disappeared from the cheek within forty-eight hours, and the area of necrosis which was diagnosed cleared up very quickly. You can see how serious it would have been for that patient if she had been sent to a hospital.

These cases are so absolutely fresh that I speak with a deep sense of responsibility to guard, if possible, against such a mistake occurring to any of you. I feel it is a very serious thing indeed for an operation to be done under such conditions. To have surgical interference employed where it is a result of misdiagnosis is a serious matter for all parties concerned.

The third structure is the anterior palatine foramen being diagnosed as an area of infection, or granuloma over one of the central incisors. It is difficult, often, to differentiate between a pathological area and a normal structure appearing at this spot. For that reason, when we see an area of rarefaction over these upper incisor teeth we must be very careful indeed, and study the patient before we express an opinion regarding the same.

The fourth condition frequently misdiagnosed relates to the shadows we get from the antrum in taking X-rays of the upper molars or bicuspid, which are diagnosed as pathological conditions. As you know, no normal structure varies more than the antrum of Highmore. It varies in size and in shape in different patients. In some people with prominent cheek-bones the outer wall will be

very prominent. The shadow shown on the film will appear to be directly over the roots of these teeth, and it is hard to differentiate between an abnormally prominent antrum and a definite diseased structure. It is difficult to diagnose whether there is present a normal antrum, or a sub-antral abscess, or a cyst. I shall speak later of how to make this differential diagnosis.

Fifth: In radiographs of the lower jaw, particularly plate pictures, the overlying vertebræ will superimpose the shadows of these structures and produce shadows which are difficult to diagnose, and sometimes it is hard to decide whether or not they are normal or pathological. To illustrate: A case was sent to me recently with the history of a difficult extraction of a lower first molar, where the wound did not heal promptly. An X-ray was taken on consultation with a specialist in Boston, and a line was seen leading from the socket to the lower border of the mandible, running at an angle backward. Diagnosis was made of a sinus, with some breaking down of the tissues. The patient was advised to go to the hospital. She came to me with the question whether or not she should be operated upon. I studied the picture carefully, and decided the line was simply the anterior line of the vertebra, which was superimposed.

Another case, brought to me for consultation, was that of a young woman who is herself a radiographer and takes radiographs for one of the surgeons. She asked me to examine an X-ray of her jaw. She had severe neuralgic attacks in the left side, running down to the clavicle, and was then suffering severe pain. The lower left molar had been under treatment, but the pain persisted. She came to me for my opinion as to whether the trouble was there. At the extreme posterior border of the lower jaw there was a shadow which looked exactly like a typical osteomyelitis. The bone was less dense, and structureless, whereas in the immediate vicinity the bone looked heavy, and yet from other symptoms it did not seem like a pathological picture. I suggested that a pic-

ture be taken at a different angle. This was done, and it showed a perfectly normal bone—which to my mind demonstrated the value of control pictures at different angles.

The point I wish to make, and a point which cannot be too strongly emphasized, is that the X-ray is only one factor in diagnosing the case. It has been our tendency to rely too much on the X-ray as final, whereas—particularly to those of us who were trained in the older school, before X-rays came, and where we had to depend on other indications to establish our diagnosis—the clinical symptoms which appear in any given case are fully as important, if not more so, as are the X-ray pictures. I do not intend to infer that the X-ray should not be used wherever there is any doubt and wherever possible. I think it is of the utmost importance to use every means at hand for diagnosis, but I do feel we must not place too much dependence on the X-ray findings. In this case I have spoken of, where the diagnosis was made of a sinus from the lower border of the jaw, there was absolutely no clinical symptom at the time I saw the patient. The probe entered the socket, in fact the socket had half healed up; there was no pus or inflammation, no swelling of any kind, nothing to indicate from the clinical standpoint the need for surgical interference.

I wish to make especially emphatic this point of the value of associating the clinical symptoms with the X-ray in diagnosing a case, and weighing the matter pro and con before deciding what is best to do with a case which presents for the possible need of operation. In the case I spoke of, where the misplaced mental foramen was mistaken for other trouble, there was plenty to account for it. A probe passed through the sinus led directly to the base of the first bicuspid, and you could establish direct connection at that point. Here, again, the clinical symptoms which were present, and which we could learn by a little painstaking care, cleared up a situation where the X-ray had caused some misleading complications.

In these five groups I have given you, the normal structures were misdiagnosed for pathological conditions.

The second group of errors, which I have attempted to classify for purposes of clearness, are due to distortion of pictures as the result of faulty technique in taking the pictures. First comes the question of impacted third molars; second, pictures of teeth deeply buried in the bone, and third, the protrusion of roots into the antrum, apparently with the possibility of antral disturbances. To illustrate this, day before yesterday a patient appeared in my office with an X-ray showing an impacted lower third molar, which apparently was crowded against the crown of the second molar. She was a woman who lived in a small city in New York State. Her physician had advised the extraction of the second molar, to relieve the pressure she was getting from this back tooth. She was not physically in shape to go through the ordeal of the surgical removal of the third molar. She went to two surgeons in this small city, who refused to have anything to do with the extracting, because they said the third molar was so firmly embedded that the two would come out together. They thought it would be just as difficult to take out the second molar as the third, and did not wish to undertake the operation. She came to Boston, and I told her it looked from the X-ray as if that were the case, but it might be the superimposition of one shadow on the other, and would probably not be so bad as it appeared. We decided to remove the second molar to relieve the pressure, and it came out like any normal second molar.

Under the second heading, where pictures of the lower jaw are foreshortened, we not infrequently have the roots running parallel to the lower jaw. We had one case recently, in the dental school, where the teeth were badly infected, and where the picture suggested the probability that the roots of the first molars went to the extreme lower border of the jaw; but in measuring up the length of a normal tooth with the length of the patient's jaw, it seemed unlikely that

that was the case, and in extracting it was definitely determined that the apparent position of that tooth in the jaw was faulty, so far as the X-ray picture was concerned, due to the distortion of the picture.

The third group, apparent protrusion of the roots of the teeth into the antrum, is often due to the angle at which the picture is taken. Under those circumstances, where clinical symptoms fail to help you to make an absolutely positive diagnosis, I think it is fair to the patient to have a control radiograph taken at a different angle to decide the question.

Just bear in mind the possibility of errors in diagnosis due to the distortion of the pictures.

In closing, I wish to speak of errors in the diagnosis of infected teeth. Just at present we are all facing the problem of focal infection, which is a very pertinent question. We always have cases where we must determine whether there is any infection due to the teeth. In determining this, in addition to the clinical symptoms and our knowledge of the teeth, we depend, of course, on the radiograph to help us. Here, again, we must be very careful in expressing a final opinion until we are sure of our ground. There are two errors common under this particular heading. First, the positive diagnosis—that is, a diagnosis of a definite infection—where no abscess is present; and second, where there is an abscess present.

Under the first grouping, we must bear in mind, in the central incisor region, particularly the upper, the question of the anterior palatine foramen. We must also take into consideration another factor, which to my mind is important, and that is the question of normal rarefaction of bone, and normal alteration in the size and shape of the Haversian canals. It happens frequently that we get in the lower jaw these large black areas which appear astonishingly like areas of infection but which really are only unusually large Haversian canals. One becomes accustomed to reading these pictures under

these conditions, because when you have these large canals the whole bone appears to be much less dense than the normal. The whole structure seems absorbed, almost as though there were a rarefying osteomyelitis present. That is usually excluded from the fact that clinical symptoms fail to give us any evidence. Where there are clinical symptoms we get the possibility of diagnosis where the infection is really not present.

Under the second heading, owing to foreshortening, we may not have infection appearing in the picture, when there is really some trouble. We also may get some indication over a root-end where there is some decrease in density, but where the absorption is not indicated. From clinical symptoms I have many times opened into suspected areas where the X-ray showed nothing, but where I found pus and bone not entirely broken down yet disintegrated sufficiently to make it pathological. The nearest simile I could use in describing this is the condition we get with the honeycomb and the honey. We get the cellular structure of the honeycomb with the honey between. In those cases we get the structure of the bone not broken down, yet, in between the spongy bone, pus is present. This is an early stage and a very definite one. I remember the first case I ever had of this type—a woman who had had a very severe case of chronic conjunctivitis, where the flow of tears was constant. She was a professional woman, and the left eye was so disturbed that she could not practice her profession. The oculist and the general physician failed to help her. The discharge of tears persisted with this very active inflammation. I finally got an X-ray of the upper teeth, to determine whether they had anything to do with it, but the X-ray indicated nothing. She had over the upper bicuspid a tenderness, and evidence of the teeth having been treated at one time for some disturbance. I felt from a clinical standpoint that there was probably some trouble at that point, and if she wanted me to go in there, I felt justified in doing so. We opened in there, and found the condition I de-

scribed. A very definite area was seen, and a very definite abscess appeared, with pus. A negative X-ray is a good deal like the negative Wassermann—it is not final evidence, by any means; sometimes the X-ray fails to show the condition.

To illustrate the limitations that may be met with regarding the X-ray: A woman came to me recently with a neuralgic pain in the upper left side of the jaw. She said the dentist had extracted the bicuspid, but did not get everything out. She had nothing back of this bicuspid. There was a very clear picture taken, and there was absolutely nothing seen of the root of the first bicuspid, which was supposed to have been left there. The picture was very clear indeed, and the socket of this tooth looked perfectly clean. The two roots of the molar were removed, with some noticeable decrease in the symptoms. The wound healed up reasonably well, and she improved considerably, but the pain did not entirely disappear. In order to check up the findings, we took another picture. She said the symptoms appeared to move back, and we took another picture at a different angle. To my surprise, when the picture came, it showed everything normal in the molar region, but just at the front, where we got into this area of the first bicuspid, it showed a very pretty picture of a root apparently. I immediately went back to my other picture to see if I had been faulty in my diagnosis, but I did not see any picture of a root appearing. I showed those pictures to two or three prominent radiographers, but none of them found a root appearing.

We are frequently misled by the angle at which this foreign body may lie, and are led to believe the patients suffer from imagination, when they really have a good basis for their complaints. This shows the advisability of not relying on one radiograph alone. Under conditions where there are no definite symptoms, it seems to me that pictures taken at one or two angles different from that of the first radiograph are very valuable.

DISCUSSION.

Dr. Isaac Gerber, Providence, R. I. I appreciate the honor of being asked to discuss this lecture. It has certainly been a very comprehensive review of the problems that are met with in dental radiography. The function of the X-ray examination in dentistry is not different from that of X-ray examinations in general. Men who devote themselves, as I do, to roentgenology know that the X-ray is not a complete diagnostic agent; it is only one part of a complete diagnosis. In some instances, as in certain types of gastric lesions and in conditions of the lungs, the X-ray may give sufficient evidence upon which to make a positive definite diagnosis, regardless of any clinical findings. On the other hand, the radiograph may furnish merely a more or less valuable addition to the other findings, helping to build up a complete diagnosis. In dentistry the same condition exists, as the essayist has well brought out. I was very much interested in Dr. Miner's review of the various errors that are made in the interpretation of dental radiographs. I know it has been the custom of many dentists to glance at a film and interpret every area of rarefaction as an area of infection.

Dr. Miner speaks of control radiographs. Much of the danger can be avoided by multiple examinations made at the same time, not being content with a simple projection of a tooth on a film, and making a diagnosis from that, but making different pictures at different angles in relation to the tooth studied. These are methods in common use in roentgenology. A man would never be content to make a diagnosis of serious pathologic conditions anywhere else on a single plate taken at a particular angle. Check-up plates are always taken, with a view to checking up errors.

As to the antrum, I have been impressed with the number of times dentists have been willing to make diagnoses of disease of the antrum of Highmore from the fact that the film did not look normal. I am convinced that no opinion

is warranted regarding the presence or absence of infection of an antrum from the appearance of a dental film. I have repeatedly checked them up with examinations of the antrum made with plates taken from various directions and sometimes with stereoscopic plates. Sometimes infection was present when the edges of the antrum looked sharp and the area looked air-containing. On the other hand, I have found an antrum perfectly aerated, when the projection on the film looked hazy, due to errors in technique; so I feel it is not permissible to diagnose antrum conditions from the film only. It requires the complicated examination with plates.

This is a very wide field, and I have only touched on a few of the points. Personally, I feel that the popularization of X-ray apparatus which has been brought about through the ability to make cheap forms for use in dental offices, while having certain distinct advantages, likewise has certain distinct disadvantages. It offers the advantages of X-ray examinations to patients who otherwise would not be able to avail themselves of them; but, on the other hand, the big disadvantage exists that the mere possession of the machine and the ability to turn out dental films will not suffice to produce a sufficient radiograph examination. The X-ray, like everything else, requires careful study and wide experience in learning to appreciate and recognize errors.

The popularization of apparatus is all right, if the dentist or his assistant is willing to give up a large amount of time and devote himself to a study not only of which switches to pull, but to learn exactly how to project teeth under various conditions and learn exactly what normal teeth look like, by studies outside of his office, by seeing large numbers of these conditions, and then learning to appreciate variations in pathology. If he would give the time to those things that he would to the method of learning root-canal fillings, I believe the popularization of X-ray work among dentists will be valuable; otherwise it will be a very pleasant form of self-delusion.

Dr. Frank Dean, Worcester, Mass.
Dr. Miner's paper has brought out points that the average man will not perhaps find an explanation of, except through men who have had experience in this work and have seen these mistakes made, or made them themselves. As a matter of clinical evidence I do not see how it is possible to make a diagnosis by means of an X-ray examination, or how it is possible for the medical man not versed in dental education to give an interpretation, or even a suggestion, that will render the X-ray of any value, except where the destruction is so much that it brings the decision as to what must be done, and the conditions that follow reveal what is further necessary.

If we go into the subject with the object of eliminating blind conditions, I think it is necessary to have a clinical chart, so far as the dentist records it—a chart which will show vital or non-vital teeth, ionization points, and thermal tests; and, if necessary, I believe we are justified in going still farther. The operator is justified in going into that tooth and verifying from internal examination its condition.

There is one point I would like to mention: There is a difference in the matter of technique on a point which has not been brought up. In dental work there is absolute necessity for a high and a medium tube. A man who uses one tube for everything will not get the results. It is possible with a high tube—not high as far as the dentist considers it—to bring out pieces of roots that may have been left there. With a low tube, with a little longer time, you can bring those pieces out. I have proved it to the satisfaction of many who have seen some of the things I have tried to bring out. I have also lost many a case myself, until that point was brought out by me.

The idea of all of us is to get a larger machine, although there is a limit as to how large a machine can be used. When it comes to making a true radiographic examination, I do not think in the average hands it is advisable to use the small machine; but with the large machine the

average man usually tries to see how fast he can take pictures, and how strong amperage he can use.

I have in mind an edentulous mouth with a history of having worn plates for fifteen or sixteen years—a case of neuralgia where everything else had been eliminated by several physicians. Plates had been taken by men who had much experience in that work. The plates were brought to me for interpretation. I studied the plates and found some conditions I could not call either normal or pathological. I asked for another picture taken at a different angle, or a film that would give me some idea as to the exact position of that area. After studying it, I had the patient come in, and discovered what I thought was the apical end of a root. However, I would not base a diagnosis on that alone. After a careful examination aided by a probe we finally located not only that root, but I noticed others, and through an opening of about three-quarters of an inch, we found these little root-ends. With the removal of them, done only recently, the patient's neuralgia disappeared.

You say you hear of neuralgia disappearing without anything having been done, but these things must be known and practiced by men using the X-ray to verify the diagnosis, which is worth about 25 per cent. as against 75 per cent. clinically.

The point is that many times, with a doubtful diagnosis, where cases are referred to one man, unless he is unusually skilful, it is almost impossible for the patient to get the benefit of a thorough examination. So the suggestion, then, is that it is well to tell the patient it would be advisable to check up with interval pictures, which may be taken over certain periods of time, and by comparison with the original, aided by clinical symptoms, we can make an intelligent diagnosis.

Dr. Miner (closing the discussion). I appreciate Dr. Gerber's coming here to discuss this paper. I have great respect for his ability as a roentgenologist. He and I are in absolute accord in reference

to what he calls taking one or two pictures; what I call control pictures he calls "multiple" pictures—I mean the taking of what he calls multiple pictures to determine the condition which is under consideration. I am also in absolute accord with him in regard to what he said about the antrum. It is absolutely impossible to make a correct diagnosis of the antrum from a dental film. You will get into trouble sooner or later if you do that. You will get a shadow from an antrum which is hazy, or which suggests the possibility of trouble, when the antrum is free from any pathological condition.

I did not mean to infer that under given conditions an X-ray would not be a positive diagnosis without the clinical symptoms as well. For instance, an impacted molar can be absolutely diagnosed by an X-ray. I do not pretend to be a specialist in radiography; my work is a little different. Just because an impacted molar is present, I do not feel it should necessarily be removed, because we know impacted teeth will remain in the bone without causing infection.

I also have seen many of Dr. Dean's pictures, and I appreciate his discussion. I did not go into the technique which he has discussed somewhat, because I have felt it would make too long a paper, but I am glad of the point he made regarding the different tubes for picture-taking. Many times a high tube will cause such rapid penetration that you will not get what you are after, but you will get other things.

In the picture I spoke of as not showing the root, the picture, so far as contrast was concerned, was all that could be desired. It was not a question of a picture being taken, but the penetration was so great that the contrast was not present. In these pictures, in speaking of errors, I assume that the picture itself, so far as density is concerned, was correct.

As Dr. Dean says, so far as the dental end of it is concerned, the work is presumably in an early stage of development. In going about and seeing some dentists using their X-ray coils, I am a

little disturbed as I see them exposing the patients to the X-ray without precaution to themselves or the patient. I was in an office the other day where a dentist was using a small X-ray machine rather freely without any precaution whatever. It is not fair to yourself or to your patient, in doing X-ray work, not to do it as it should be done.

The Secretary read a communication from Chas T. McMurray of Fitchburg, Mass., with reference to changing the time of meeting to the summer months, July or August.

On motion of the Secretary the letter was accepted and laid on the table.

THE PRESIDENT. The National Dental Association will hold its meeting this coming year in October. It is the custom of this association to meet in October. What action shall we take in regard to this matter?

Dr. CROSBY moved that the same be left to the discretion of the Board of Censors. (Motion carried.)

Dr. POND. I would move a vote of thanks to the DENTAL COSMOS for the very efficient services of our stenographer, Mrs. Weil, and for the publication of our proceedings each year. (Motion carried.)

The President appointed Dr. Crosby to escort the president-elect to the chair.

Dr. STILSON. I can truthfully say I wish you as much pleasure as I have derived, and the support I have had from the officers and the committees, and if you receive that support, I am sure we can have a better meeting next year than we have had this year. I hope the society is on the road to more beneficial and useful meetings than we have had

for some years past. With those good wishes, I present you this gavel.

Dr. POND. *Ladies and gentlemen,*—It seems a ridiculous thing for me to make a speech of acceptance with such a small audience, but I will say I appreciate this honor and will do my very best to serve you in the office to which I have been elected. If I can do as well as Dr. Stilson I shall be very well satisfied. I hope I shall have the loyal support of all the members in producing next year the biggest meeting we have ever had. It will be the twenty-fifth annual meeting, and should be held in Boston. We shall have fine facilities there, and I hope it will be a great meeting.

I hope the membership will be increased, and wish that everyone would do a little missionary work in his own locality to bring in a larger membership. We should have 1000 members, which would give us \$2000 income, and enable us to have the finest meeting New England has ever had. Not that I am desirous of having a record membership, but with that number of men we could make this society a sort of National Society for New England, and it would put our meetings on a little different plane than the state societies generally. If there are suggestions from men, or anything they wish the society to take up, I wish they would write to the secretary about it.

Dr. STILSON. Of the six New England state-directors, only two are present, and I move that the reading of the reports of the directors of the Preparedness League be dispensed with at this meeting, and that those which are received by the secretary be published in the Transactions. (Motion carried.)

There being no further business, the meeting adjourned.

Academy of Stomatology of Philadelphia.

Monthly Meeting, Tuesday Evening, April 29, 1919.

THE meeting was called to order by the president, Dr. Salvat, at 8.15 P.M.

The minutes of the preceding meeting were read by the secretary and approved. The report of the Council was also given by the secretary, and the report of the Essay Committee was made by its chairman.

The literary part of the program was then taken up, the President introducing the essayist of the evening, Dr. KURT H. THOMA of Boston, who then read a paper entitled "Clinical, Roentgen, and Microscopic Diagnosis of Dental Conditions."

[This paper is printed in full at page 742 of the present issue of the DENTAL COSMOS.]

DISCUSSION.

Dr. L. A. Faught. *Mr. President and gentlemen of the Academy of Stomatology,*—The Academy is to be congratulated, I think, on having this very interesting paper presented by Dr. Thoma this evening, and particularly so as he has taken the trouble to bring with him these very beautiful slides. We have learned, I believe, as much by what has been shown on the screen as by what we have heard in the text of the paper. The matter of asking me to open the discussion seems hardly right when there are so many here who are perhaps better able to discuss this topic than I, simply because my experience has not led me so far afield as the younger element have been led into radiography. This paper is to be looked upon as being written from the surgical standpoint; that is, Dr. Thoma is endeavoring to impress upon us the need of clinical, X-ray, and microscopic diagnosis. Such procedures

as have been outlined are far more possible in the office of the specialist or the man devoted to surgical work than would be the case in the offices of those who are devoted strictly and primarily to non-operative procedures and general dentistry. Nevertheless, the procedures demonstrated this evening may at times become some of the greatest work we have in hand.

I can only speak to you, therefore, in a general way. The latter part of the paper appealed to me in the fact that if we would take pains to preach preventive dentistry and train the young among our patients in the way they should go, we should avoid the necessity for this extensive diagnostic work. I believe that is why I have so little of practical value to offer to you this evening. In my own work, which has been a matter of growth for some years, very little of the character of work shown this evening would drift into my hands. I have the advantage of having a practice that has grown up under my care, and in which I do not meet those disease conditions that you would with the general public coming to you with teeth to examine—teeth with congestions, or a mass of conditions which have developed before you take the patient in hand. I do not have among my patients many of those things. Once in a while something drifts in that is of interest and in which this kind of work can be used, but this is not of common occurrence.

I concur with the thought of the essayist that we should not take anything for granted. The X-ray today has certainly made its way into the hands of many dentists, and decidedly into the hands of the medical profession, that is,

the general practitioner of medicine; and while it is a decided help in our work, at the same time it is our avenging angel. We know, much to our distress, that at times, without our knowledge, our patients are taken by physicians, their mouths X-rayed, and things told them that should not be. They are then referred to us with this history in their hands, and when they come we are supposed to follow the instructions of the physician instead of making our own diagnosis. This leads to a condition of combativeness between the physician and the dentist that I greatly deplore. That the physicians are beginning to recognize that the dentist should be consulted in these matters is a confession on their part which I want to accept with all the grace possible. We want the medical man to do this, and we desire, as far as we can, to come into harmony with him, but the mistake he makes is as outlined above. He should work with tact. The handing of films and plates to patients, with statements that should not be made to them, is, I think, a great mistake.

I quite agree with the essayist that the flood of X-ray machines which have come into the offices of dentists is, perhaps, not an unmixed blessing. It is an advantage, when our interest is attracted to some special condition, to be able to make the film at the time and observe it at once. Still, it is a work that is peculiar. The knowledge which is brought to us by the X-ray is of two kinds; it is either positive or negative. Where we are looking for positive indications it is of advantage. If we are looking to see whether something has been brought into the canal of a tooth, such as a broken-off piece of instrument which should be removed, or whether a canal has been filled to the apex, then we get positive information. So, too, we get positive information regarding pulp stones as a cause of neuralgic conditions, and it helps us to estimate the number of roots with which we have to deal. Very frequently the plate shows us something we did not know. It is also of advantage in informing us of the existence of supernumerary teeth or other teeth that do

not show in making an ordinary examination of the mouth in question. All these positive indications I know every dentist will appreciate, and as well as revealing the possibilities in reaming out a canal for the purpose of planting a post, it shows us whether we are too near the outer portions of the root and whether we have room for planting the post.

As to the negative indications, the picture gives us only one thing, as the essayist has pointed out—a study of shadows; there is really no indication of a disease. The negative indication is only of value to us as we have the ability to read and to interpret, and that must be acquired by some years of careful study—the ability to distinguish the real meaning of the various shadings and shadows. In other words, caution is to be used in making any interpretation of them. It would almost seem, sometimes, as if it were better to do as I have done, largely, in my work. I often prefer to send my patients to an expert radiographer, and have him make the plates, because he knows the best way to get the information that I am seeking, and I have the advantage of the interpretation and suggestions of a man capable, through long experience, of reading these conditions.

I would say, regarding the slides, that they show us the microscopic appearances most beautifully indeed, and they are exceedingly instructive to me. The slides show the tissues very beautifully; and one could learn much, if he had the time to look them over with care and study them. I appreciated that part of Dr. Thoma's paper very much; the slides are just as valuable to me as the literary portion of the presentation.

As to the value of making a clinical record, I think most dentists are inclined not to proceed along systematic lines, as the essayist has suggested, yet I think that would be quite desirable. I can only speak in a general way, and tell you what I have done in my own practice for years. Many years ago I reasoned that it was necessary, and put it into operation, and it has been of so much benefit

to me that it has not been discontinued. I established in my office a book of record known as the "docket," which is always in the rear of my chair, on a properly arranged pedestal; and my assistant is there to take down and place in this book the records of fact at the initial visit, or at any subsequent visit, of the patient. Most patients come to me regularly in the three regular periods of the year—autumn, winter, and spring. We should also have a period in the summer, and would, except for the vacation season. At these initial examinations the history of the mouth is very carefully noted in this docket. Instead of taking the time to leave the chair and do it, I mention the points to my assistant, and she records them. That system runs through a series of years, and constitutes an exceedingly valuable record. By this means I am able to take note of certain apparently trivial things that at the time call for no interference, but the records of which subsequently prove of value in certain conditions which arise later in the mouth of the patient. I can go back and put my finger on the time such conditions first arose, and during the course of time I learn from such a docket to interpret their meaning. I do not have to wait for a year or two in order to find their practical value, but can begin at once to institute operative procedures—far in advance of what I was formerly in the habit of doing. I find that method exceedingly valuable. I have no doubt that when one goes into surgical procedure, it would be valuable to have a means of keeping all the films and plates relating to a certain case together. The dentist should accustom himself not only to periodically looking for cavities and things of that description, but should take note of the various physical signs indicated both in the teeth and in the adjacent soft tissues of the mouth. He should also consider the clinical condition of the patient, and take note of any illness that has occurred in the interval since the last visit, perhaps, and its effects. You can train yourselves to seeing the indications in the soft tissues, and as the essayist sug-

gests, interpret symptoms and be able to make suggestions to the family physician, leading him to feel that he has in you a coadjutor in his work.

Dr. Hermann Prinz. There are several points that have occurred to me during Dr. Thoma's discourse. In the first place, I think we should lay more stress on the interpretation of pain. If we find that the pulp is involved, one of the primary aids at our disposal for diagnostic purposes is the use of the electric current. Dr. Thoma has mentioned that the electric current is of service. To me, it is the most important diagnostic instrument I can think of. With the aid of the induction coil we have at our command a means of portraying the relative condition of the healthy or the diseased pulp. When we master the technique of applying the electric current to the tooth, it is an easy matter to determine the condition of the pulp.

When the periosteum is involved, palpating the respective lymph glands will enable us to locate the tooth which is involved in the process. This method was first brought out by Partsch about 1900. It is unfortunate that dental practitioners in the United States do not make use of it more extensively.

Regarding general diseases as expressed by specific symptoms in the mouth, Dr. Thoma has referred to a number of them. Frequently the dentist may be the first one to detect certain general diseases by their manifestations in the oral cavity. For instance, diabetes mellitus usually is readily recognized by a most rapid accumulation of soft, cheesy tartar around the teeth and by loosening of the teeth. There is also a marked sweetish odor of the breath due to the formation of acetone. This is merely an instance in which a general disease finds its local expression in the oral cavity. Locomotor ataxia in its early stages may leave its distinct impression upon the pulps of the teeth by a process of degeneration of the nerve endings. We may enter into the pulp with a bur without the slightest expression of pain on the part of the patient, although the pulp may seemingly be nor-

mal. At once our suspicion should be aroused. Stand the patient against the wall and let him close his eyes and walk toward you; and if he cannot do it in a straight line, you may know there is something vitally wrong—as loss of co-ordination, the so-called Romberg symptom, is a common sign of ataxia. The Argyll-Robertson symptom, *i.e.* loss of pupil reflex to light is the second important symptom, and the absence of patellar reflex, the Westphal symptom, completes the chain of evidence. It is not necessary to inform the patient about these findings, but it is imperative to get in communication with his physician and notify him of our suspicion.

Again there may be a disturbed condition in the oral cavity that we are firmly convinced is a typical Vincent's stomatitis. Whether it is due to Vincent's bacillus or is an ordinary mixed pus infection is hard to say from a purely clinical examination. As Dr. Thoma has pointed out, it is an infection that can be prevented. When we see a peculiar white spot on the tongue or mucous membrane, we should be suspicious that the underlying factor may be a syphilitic infection. It is then our duty to send the patient to someone who can make a Wassermann reaction. When this has proved negative, we are then sure we have at least eliminated the syphilis factor, and it is then usually due to some irritant, commonly to smoking, etc. We must inform the patient that he must abstain from chewing or smoking; and by the use of local applications we find that the mucous membrane will assume its normal condition in due time. One could cite many instances in which the oral cavity is the primary seat of expression of a general disease. As Dr. Thoma says, the underlying factor of the practice of medicine as well as dentistry is a mastering of diagnosis. An old aphorism says: "A good diagnostician is a good physician." The patient should be broadminded enough to recognize the fact that there are other things in life than merely a bicuspid or a molar. Whenever we look in the mouth of a pa-

tient we should carefully seek the cause of any disturbance which may present itself. Therefore I think this paper is extremely timely, and I wish to express to Dr. Thoma my personal thanks.

Dr. Willis S. Manges. *Gentlemen and members of the Academy of Stomatology*,—You are all very good to permit me to come and speak to you, so soon after the last occasion. I am sure we have all had a real treat this evening. Dr. Thoma has presented in a short time more real valuable material on this subject than I have heard at any other medical or scientific session for many a day. It is characteristic of Dr. Thoma to present a great deal in a short space. If you read his books you will find that they are almost all meat, almost all good. His article tonight is not long, but there is not a great deal of importance that is missing.

As I followed his paper I made a few notes, and only want to make some brief remarks with the idea of perhaps emphasizing some points. I have not a single criticism to make of anything he has said. The points that seem to me, as a roentgenologist, to be of most importance are these:

First, a complete examination. At one time I did a great deal of work for dentists; I still do such work for a few, and enjoy it. I am doing more and more dental work every day, which means that I am getting patients from the general practitioner, from the surgeon, from the intern. The doctor does not now send a patient to have a tooth that has given some trouble examined; he wants to know about the entire mouth. Why does he send the patients to me, a medical roentgenologist, instead of to the dentist? In the first place, the medical man or the surgeon is not today aware that most dentists have X-ray machines in their offices; and some who do know feel that perhaps the dentist has not had sufficient experience in roentgenology to give everything from a surgical point of view they may want to know. I believe the time is coming when all this sort of thing will be properly

apportioned. In other words, when you have developed into good roentgenologists as well as good dentists, as you are now, then the surgeon will not send the patients to me, but to you. But you must convince him first that your X-ray work is satisfactory, and that you are using it to its fullest advantage.

There are many reasons why complete sets of teeth should be examined, not only the first time you see the patient, but a number of times thereafter. You should insist upon it not less than once a year. These infections start sometime. In most instances we see them when far advanced, and often there has been a time in the history of the lesion when you could have accomplished something worth while if you had known of its existence.

Another advantage in routine examination is that you have a record of every tooth; and on subsequent occasions, when trouble arises, you have a record of the progress of the lesion. I wonder how many of you appreciate the real course of the disease which finally develops into the so-called chronic apical abscess, or granuloma. When does it start? How long does it take to develop? When does it wind up? It certainly does not occur over night.

I was very much interested in the case of Mr. W., whom Dr. Thoma spoke about. It illustrates not only a point of great value to you as dental surgeons, but a thing we are constantly hearing about in surgery and medicine. A case was sent from the South for operation for carcinoma of the stomach. The diagnosis was made after an apparently very careful examination, including an X-ray examination. It is true the patient had a marked deformity of the stomach, but the roentgenologist failed to slip the fluoroscope up over the chest. If he had done so, he would have found an enormous aneurysm of the aorta, a condition immediately contra-indicating a major surgical operation, and one which, furthermore, gave an almost positive clue as to the condition in the stomach. The patient had a syphilitic condition of the

stomach, not a carcinoma. His gastric symptoms disappeared under treatment, without an operation at all, and the examination had been only a partially complete, not a complete one. At one time we made gastric examinations that way, but we do not do so any more. In the case of every patient that comes to me for gastric study, I first make plates of the kidneys, ureters, and bladder, then of the liver and gall-bladder regions. We fluoroscope the chest. If we do not see any gross lesions, there may be fine points in these areas that we overlook, but we may be pardoned for these.

I should like to emphasize what Dr. Thoma has said of the value of really good roentgenographic work. I spoke of this to you the last time I was before you, and I would repeat that it is important that you should not only have good roentgenograms, but uniform pictures. If you like a film of considerable density that you may examine in a strong light, and there are advantages in that, try to take the picture that way each time. If you want a thin film, showing everything in sharp detail, but with not much contrast of shadow, you can get it, but do it uniformly and knowingly. There is nothing so important in roentgenology as the uniformity of the roentgenogram. It is especially important in bone pathology, which you have to deal with here. Personally, I prefer a film that has fairly good density, that requires a strong light (and the best light is northern sky light, the kind most of you work with), and a film of good rich contrast—which means you have penetration enough to show the detail, even in dense portions of the bone.

That leads up to the point that you *do* infer the character of disease from the shadows you see on the film. They are not labeled. It is not written there that this is a staphylococcus infection, and the film does not tell you it is a staphylococcus infection; but if you stop to think and go back over your own cases, you will find that the film does tell you a great many things. It tells you whether the destruction at the apex of

the tooth is in a fairly acute stage or in a chronic state. It will tell whether the abscess is well or poorly walled off; whether the wall is thick on one side and thin on another. If it is, it is like a bomb, and is apt to explode. I am sorry I did not think to bring a film along tonight which demonstrates this point very clearly. The one point in the detail on the original film was such that I argued that the tooth should be extracted. It was not favorable for apicoectomy, and it was not done, but an attempt was made to drain the abscess through the root-canal. Finally the abscess broke down, and came near spreading over an extensive area. If the detail is sharp, which means that you must have a tube of sharp focus point, your film must be in good contact with the tooth, the patient must be absolutely still, and your exposure must be sufficient to give the kind of penetration and contrast I have spoken of; then you will see the condition early, before the bone is broken down to any extent. You still see the lacunar spaces, but the walls have a detail that is less sharp—just a little cloudy as compared with the adjacent tooth. These are indications that the little spaces in the bone are filled with something that is under tension, and is increasing the density of that particular area.

You can tell that you have a granuloma by the exceeding sharpness and density of its walls; that is the only difference; but it is sufficient. The destruction you get in sarcoma is entirely different from that which you see as a result of cyst formation. In the case of sarcoma it is as if there were some design being cut out; in the case of carcinoma, it is more as if the bone were being dissolved with an acid. There is no line of demarcation whatever.

But I am getting, perhaps, too far afield. In regard to cheap apparatus, I wonder whether I am going to make a mistake by saying it is possible with such apparatus to get good films occasionally. I wonder whether I am making a mis-

take in saying that. I certainly do not want to encourage those of you who have not supplied yourselves with X-ray machines, to buy cheap ones. It is possible to get good films with them occasionally, but listen! We have discarded that type of apparatus ten years ago. We are getting away, even, from the gas type of tube, just as fast as we can possibly get the newer type, the Coolidge tube. In the one case we have to control the penetrating quality entirely by the vacuum in the tube—and it is the most uncertain and mean thing to handle I know of. The same tube will behave differently on different days. Certain types of apparatus do work with gas tubes better than others, but I believe (and this is what I learned during my experience in the army, where I had to teach large numbers of roentgenologists) in the standardization of results. We made our students work at a definite distance, with a definite voltage and definite milliamperage; and the result was that a knee taken today could be compared with the same knee taken a month or two months before. We could tell the extent of the bone change—whether there was more decalcification, or whether the bone salts had advanced more. That is of benefit. If you can get standard results, interpretation will become simple and easy to you men, who know dental pathology and anatomy so well. It is difficult for the average roentgenologist to interpret dental films, and I would not give the snap of my finger for some of the interpretations I have listened to, because they have not stopped to study dental pathology and anatomy. When it comes to getting good films and good plates of the jaws, I am sure if you take Dr. Thoma's books, and a few books like them, it will not take you long to learn to interpret the plates to advantage.

I just want to tell you a little trick about keeping films. We have stopped binding them between two pieces of glass. We now take a piece of perfectly plain celluloid 5 x 8 in. in size, or slightly smaller. We then take an ordinary paper-

clip machine with which we fasten papers together. Each individual film, in proper relation, is thus clipped and fitted to the large piece of celluloid; and when properly arranged, we put another large piece of celluloid on top, run a row of clips down the center, and put a binding-strip on the edges. You can send this through the mail. The films are always in proper relation one to another, and you know which you are dealing with.

I want to make just one more point, and that is the importance of the relation between dental infection and somatic disease. I want to illustrate it by a patient I was treating for exophthalmic goiter. The nervous symptoms disappeared satisfactorily. The patient slept better, had a good appetite, and all that sort of thing, but the pulse rate would not go down. There was even a perceptible change in the size of the gland and a lessening of the exophthalmos. She reported that her dentist had given her a clean bill of health. But I was responsible for that lady's condition, so I made a dental examination myself, and found one nice big periapical abscess. I had this tooth extracted, and did not stop to consider whether or not it should have an apicoectomy. I wanted to see that particular focus of infection eradicated. Probably from the dentist's point of view I made a mistake, but I wanted the pulse rate to come down, and did not want to take chances on the infection's being spread or not being eradicated. In two weeks the pulse was 80, and it had not been below 120 prior to the removal of the tooth. The patient kept on improving. I saw her a month ago (two years afterward), and she has absolutely recovered.

I want to express my thanks to Dr. Thoma for his presentation this evening.

Dr. Thoma (closing the discussion). As the hour is considerably advanced and as no special arguments have been brought out in the discussion, I take it we all pretty well agree. I should like once more to point out the great impor-

tance of a complete examination; not enough can be said in that respect. By reviewing cases in my own practice, as well as reading the literature, one cannot help seeing that there is everywhere a great shortcoming in the making of diagnoses and in the method of examination. Case after case can be shown in which some slight oversight made a great difference in the treatment and in the improvement of the patient. Most of the cases I have cited tonight I have especially chosen, in order to point out the great importance of careful investigation and methodical examination.

The question of X-ray apparatus is just one more point I should like to take up. I have mentioned cheap machines. Of course I do not mean they are not good simply because they do not cost a lot of money, but I mean it is not a good investment to buy a small dental machine. The worst feature is the coil. The coils are often poorly insulated, and the insulation soon becomes worn. After a while, instead of the spark going around the coil it makes a short cut, decreasing the efficiency, which gradually becomes reduced to a half, a third, and a quarter of what it was—and you wonder why you have to make much longer exposures and get poorer results. While you may be able to interpret such pictures they will not be good enough for a careful diagnosis. Only yesterday, I had a set of X-rays sent with a patient from a dentist who wanted four teeth extracted because he thought they were abscessed. The films were under-exposed and over-developed, and even with the strong electric light I could hardly make out the roots of the teeth. I did not feel satisfied with the films nor justified in extracting the teeth. As the patient seemed to be in good health, and radical measures were not indicated, I proceeded to take more pictures for my own satisfaction, and found that the teeth, while devitalized, showed absolutely no indication of any periapical infection.

On the other hand, poor X-rays often show no evidence of disease, and yet, if

you make a good picture, you many find some large abscesses. This shows that a poor X-ray is not only a poor basis upon which to make a diagnosis, but that it may do harm to the community at large.

I want to thank the Academy for their invitation. I enjoyed very much the

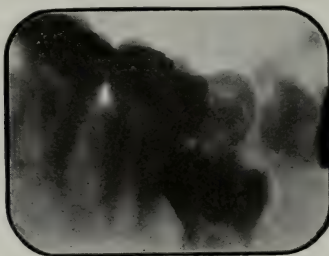
discussion of my paper, and want to thank the gentlemen who took part in it for helping to make the evening of interest.

Dr. Thoma received a rising vote of thanks.

The meeting adjourned at 10.30.

A DENTAL ANOMALY.

THROUGH the courtesy of Dr. HERBERT McCONATHY, Miami, Fla., we publish the accompanying radiograph of the jaw of a boy



of seventeen years in which will be seen three fairly well-formed lower right third molars. The teeth were extracted under conduction anesthesia with novocain by Dr. G. D. Laymon of Miami.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDWARD C. KIRK, D.D.S., Sc.D., LL.D., *Editor.*

L. PIERCE ANTHONY, D.D.S., *Associate Editor.*

PUBLISHED BY THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE. including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Virgin Islands, Cuba, and Mexico. Canada, \$1.40. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the EDITOR, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, AUGUST 1919.

EDITORIAL DEPARTMENT

Specialization in Dentistry.

THE development of dentistry within the past decade has been so rapid that it has come to be looked upon as beyond the ability of the average practitioner to encompass singly the practice of the profession in all its branches. The increased demand for dentistry in general and for a higher class of work in particular as the result of the enlightenment of the public on subjects dental has stimulated the profession to devise ways and means of meeting the demand for higher-class work, and it seems that the most expeditious method of meeting this demand is by increased efficiency in the different branches, with a logically increased efficiency for the whole—hence the day of specialists in dentistry. Specialization is in the dental air, and within the past few years it has received an impetus which threatens to carry us to a point where it may lessen to a degree the general humanitarian value of dental service to the public.

The oral hygiene propaganda has resulted in a material increase in the demand for dentistry, and specialization will certainly not be a means of meeting this increased demand at a time when the profession is already taxed far beyond its capacity. Specialization may meet the demand for better dentistry, but what is to become of the masses of people, the people we are endeavoring to educate, and with a large degree of success, as to the value of dentistry, the class that needs it most? They certainly cannot afford the services of the various specialists, and dentistry, we dare say, will become more of a luxury to this class than it is at the present time.

The narrowing influence of specialization will, we fear, tend to emphasize more pronouncedly the criticism which has already been raised against dentistry as a specialty of medicine, namely, that the dental specialist inevitably comes to view all diseased conditions of the human body through the narrow lens of his particular specialty, and therein we believe may lie a source of detriment to dentistry. Dentistry at best is more or less narrowing, and the continued subdivision of a specialty into sub-specialties will in the nature of the case exert more strongly this narrowing influence. The average dentist in the past has been charged, and with a degree of justification, with inability to see beyond the tooth, and if our specialization tendency leads us, as it now threatens to do, to the point where some will eventually confine their efforts to a particular portion of the tooth, then the logical eventuality will be that the sub-specialist will be charged with not being able to see beyond his particular portion of the tooth. In the light of the foregoing premise is it not appalling to contemplate the restricted mental vision which may possibly result from confining one's activities solely to one portion of the tooth or one limited phase of dentistry, and is there not the danger of developing what President Wilson has termed a "one-track mind," with too narrow a track?

The development of specialties will doubtless enable the specialist to demand higher fees, which everyone agrees would be helpful to the profession on the whole; but something more than the desire for higher fees should be the stimulus which eventuates in the announcement of a dentist as having confined his practice to a particular specialty of dentistry. In speaking of this

phase of specialization in dentistry, Dr. Paul Stillman, in his report on "Practice" before the Dental Society of the State of New York, very aptly says:

The entering into specialization signifies a frankly acknowledged ability in some chosen special branch. When an announcement is backed by real ability plus experience, the world is better for the change, perhaps, but when a specialist is announced whose only excuse is a greedy desire to profit at the expense of the profession and the public and a desire for larger fees and shorter hours, every man in the profession is at once personally injured.

There is, however, much to be said on the other side of the question. It is only logical to assume that the dentist who specializes in one phase of dentistry will become more proficient in that phase than one who undertakes all phases of general practice, provided the specialty is the mature development of long experience in the general practice of dentistry. We readily admit that, other things being equal, the specialist should be able to render more efficient service in his particular branch than the general all-round man, and this is forcibly exemplified in specialization within the medical profession. We have also an exemplification of the narrowing influence of specialization in our sister profession. Who has not heard and known of the surgeon who has specialized in one line of work, diagnosing and operating for almost all conditions in the belief that he is treating the condition with which he is most familiar? For instance, to what ridiculous extent has not the appendicitis fad carried specialists who are prone to see an inflamed appendix in almost every abdominal cavity that exhibits symptoms of disease!

But we need not go to medicine or surgery for examples of fetishism. In our own profession we are all only too familiar with the eagerness with which the dental profession seizes upon a new method of procedure. We are today in the midst of a wave of enthusiastic condemnation of septic teeth as the cause of systemic conditions. We have over-enthused over the use of the X-ray as a diagnostic agent which shows us the evils of past practice, which is causing many of our leading operators to reverse their opinions of tooth conditions as well as their methods

of procedure. We do not deprecate the value of the X-ray as a diagnostic aid, nor do we wish to minimize the dangerous potentialities of oral focal infections, but simply cite these as instances of our readiness as a profession to adopt and carry to extremes new methods and procedures. One of our leading advocates of the use of the X-ray in dentistry, as the result of observing the ability of the novice in X-ray work to see almost anything he is looking for in the X-ray film, sounds this timely note of warning:

In order to make a good diagnosis we must not become obsessed with the infallibility of any particular diagnostic agent, because the wider and longer experience a man has, the greater will be the caution with which he relies upon any one agent.

Some of the leading members of our profession have become so, shall we say, obsessed with the idea and have so ardently advocated the subdivision of dentistry, that we now have the following distinct specialties in dentistry: Oral Surgery, Prosthodontia, Exodontia, Orthodontia, Periodontia, Radiodontia, and more recently recognized as such, specialists in Crown and Bridge Work—or shall it be Pontiodontia?—specialists in root-canal work, apicoectomy, etc.

Shades of Webb, Varney, Perry, *et al.*! What has become of operative dentistry, the foundation upon which modern dentistry was built, and we dare say the most important, the most difficult, and the most neglected branch of our profession? True, the ultimate aim of our present oral hygiene propaganda is the elimination of operative reparative procedures as well as all other reparative procedures, but we do not believe the operative dentist should be eliminated before we eliminate the need of his services.

As an ardent advocate of specialization in dentistry our esteemed contemporary, the editor of the *Dental Items of Interest*, is a conspicuous example, and so strongly does he believe in the cause that he has recently undertaken almost single-handed a propaganda for the establishment of a definite and distinct specialty in bridge work, and to be more specific, removable bridge work. In the light of our present knowledge of focal infections and oral sepsis we are not sure but what he has exhibited an unusual degree of perspicacity in advocating removable bridge work spe-

cifically, for if the efforts of some medical and dental enthusiasts in the direction of eliminating all suspected oral foci of infection are successful, all bridge work will be "removed" from the mouth and consigned to the scrap-heap in the future. However, we believe that day to be as far remote as the day when we shall see the elimination of the need for operative dentistry.

We believe that the future of bridge work, and more particularly removable bridge work, will be largely and almost entirely dependent upon the final outcome of the present research being done in regard to the relation of devitalized teeth as septic foci to serious systemic conditions. One of our contributors in the present issue goes so far as to say that "Every devitalized tooth is a septic tooth." What, then, is to become of removable bridge work, with its necessary devitalization of teeth for use as abutments? We are not unmindful of the fact that bridges in some, but we believe comparatively few, instances can be placed on vital teeth, but the great bulk of removable bridge work must in the nature of the case be placed on pulpless teeth. In the meantime, many of our expert bridge workers will continue to perform good service with both removable and fixed bridge work, for we believe the success of bridge work lies not so much in the question of whether it is fixed or removable as it does in the manner in which it is constructed, and beyond all other considerations the foundations upon which it is built.

We welcome the practice of specialists in dentistry in so far as they will increase the efficiency of individual efforts, but let us not succumb to the evil surrounding most specialties, that of making the balance of practice subordinate and of secondary importance to the specialty itself. Let us not forget the ideals of modern dentistry, and keep in mind the fact that a given specialty is only a contributing factor to the ultimate aim of modern medicine—prevention.

Dr. John F. Dowsley.

WE regret that as this issue goes to press we have received notification of the death, on July 17th, of Dr. JOHN F. DOWSLEY of Boston, Mass., a trustee of the Forsyth Dental Infirmary for Children, and for many years a member of the Board of Dental Examiners of Massachusetts. An extended obituary notice will appear in our next issue.

PRACTICAL HINTS

This Department specially welcomes the brief presentation by our readers of any novel suggestions or methods which in their own practice have proved to be time-saving or to possess other features of advantage.

A Case of Exostosis.

By W. T. CHAMBERS, D.D.S., Denver, Colo.

THE patient, now sixty-three years old, first observed growths on each side of the superior maxilla when fifteen, at which time they were about the size of Mexican beans. From that time the de-

velopment continued over a period of twenty-five years, when growth ceased, with no perceptible change since.

local irritation, which is always supposed to be the cause of exostosis. In examining the literature upon the subject, it is found that the teeth are reported affected in thousands of cases to

FIG. 1.

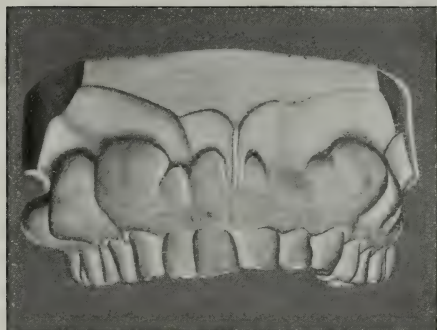


FIG. 2.



velopment continued over a period of twenty-five years, when growth ceased, with no perceptible change since.

This case of exostosis, like others reported, is strictly benign. The patient has always been free from pain, except when the most prominent parts have been accidentally struck by the toothbrush. Fortunately the surrounding tissues have been free from disease. He cannot recall anything in the way of

one of other bones, probably because of constant irritation in masticating.

The lower jaw presents on the lingual aspect four enlargements the size of ordinary peas. There is no disfigurement, as the accompanying photographs show, and as the patient experiences no discomfort, he feels, in view of the fact that there is no increase in the size of the growths, that an operation is contra-indicated at his age.

To Fit a Backing to a Tooth.

By A. L. ROAT, D.D.S., Philadelphia, Pa.

A SIMPLE, effective, and quick method for this purpose is to mark and cut holes in the backing and fit it over the pins. Press the pin side on a Faber eraser and

bend the eraser up over the tooth. Place on the bench and strike the eraser with a hammer. The backing will fit well. The porcelain will not crack or check.

Report of a Case of Emphysema.

By LOUIS N. DIAZ, D.D.S., Havana, Cuba.

REFERRING to the case of emphysema reported in the April Cosmos, I wish to describe another very similar case which came under the notice of a practitioner with whom I am associated.

The patient was a young man sixteen years of age with a second right upper bicuspid which had to be devitalized. The usual procedure was followed, *i.e.* an application of arsenic for removal of the pulp. The canal was found to be quite large, as is usually the case with young persons, the foramen also being found to be above normal size.

Just before sealing the canal, as the final step the operator proceeded to dry out the canal with a hot-air syringe, the air compressor registering fifteen pounds. The operator was so taken up with the operation that he did not see a gradual swelling of the tissues on that side of the

face, until the patient called his attention to it. The patient was by this time gesticulating and giving all signs of a man in distress. The swelling was strictly unilateral, much enlargement showing under the eye and over the whole cheek, giving all indications of being intramuscular rather than subcutaneous. As the air did not appear to escape through the canal, the tooth was sealed with gutta-percha and the patient sent home, the operator reassuring him by stating there was nothing amiss in that peculiar condition, and telling him to return on the following day.

When the patient returned the swelling had subsided to a great extent. On the third day everything was found to be normal, whereupon the canal was filled, and up to the present day it has not given sign of any abnormality.

REVIEW OF CURRENT DENTAL LITERATURE

[*Lancet*, London, June 7, 1919.]

Fistula of Parotid in War Wounds of the Face and Jaws. BY PERCIVAL P. COLE.
(With a Note on Radiation Treatment by ROBERT KNOX.)

Cole, in a very extensive experience during four years, has encountered only sixteen cases of parotid fistulæ. He classifies the conditions as follows:

Fistulæ of the duct: Incomplete. Complete.
Fistulæ of the gland.

Gland fistulæ and incomplete fistulæ of the duct show a tendency to heal. Should healing be delayed, application of radium or roentgen rays is indicated. Gland fistulæ and incomplete fistulæ of the duct have never failed to respond to radiations. Complete fistula of the duct is curable only by operative measures: (1) Seton operations, (2) atrophy operations, and (3) reparative operations. The seton operations are mentioned only to be condemned. The atrophy operations rely on the resection or avulsion of the auriculotemporal nerve—*cf.* Dieulafoy, *DENTAL COSMOS*, April 1918; Escalada and Jorge, *Journ. Amer. Med. Association*, June 1, 1918, p. 1641; and Ianni, *ibid.*, December 7, 1918, p. 1947. These methods are not approved by Cole.

The technique of a reparative operation, as performed on two patients, is detailed by Cole. His method rests on the general principle that if the duct will not reach the mouth cavity, the mouth cavity must be made to reach the duct. A curved incision with convexity down and a small flap reflected upward is made. This displays the duct, the distal end of which was buried in scar tissue. The duct was freed, its terminal portion resected, and two very fine catgut traction sutures passed through its walls. The mucosa covered by the buccinator was then made prominent immediately in front of the masseter by means of a small swab pressed against

it from the inside of the mouth, and a small longitudinal (horizontal?) incision was made through into the mouth. The masseter was notched at its anterior border, and the margins of the mucosa were stitched to the deeper margins of the wound. Through the aperture thus created the stay sutures were passed, and the duct was gently pulled into the funnel-shaped extension of the oral cavity. The duct was buried in the extension, and the extension was cut off from communication with the exterior by catgut sutures. The skin was then sewn up, and drainage established through a small stab incision. Each stay suture through the duct was then made to take good hold of the oral mucosa, so that when tied the duct was secured in place. Firm healing occurred in a few days. Both cases were kept under observation for three weeks, and then discharged. No branches of the facial nerve were involved, and no facial paralysis occurred.

Technique of radium exposures for parotid fistulæ. Exposures to a penetrating radiation from 200 mg. of radium contained in platinum tube of a thickness of about $\frac{1}{2}$ mm. were employed, and in addition 3 mm. of lead to cut off all or nearly all of the hard *beta* radiations, and allow of the *gamma* radiations being used. The radium tubes were inclosed in rubber tubing, and in addition several layers of lint were used on the skin to cut off any secondary radiations from the metal filters. An exposure of three to four hours was given to each skin area. In one case each area received six hours' exposure. The variation in the time factor was estimated on the condition of the tissue in each case, those with considerable induration of tissue receiving longer exposures than others. No marked reaction was obtained in any of the cases treated. In a number of patients roentgen rays were combined with the radium treatment, small doses being given at short

intervals. The roentgen rays were filtered through 2 mm. of aluminum.

[*Pacific Dental Gazette*, May 1919.]

In re Itinerant Dental Instructors. EDITORIAL.

At a recent meeting of the Los Angeles County Dental Society a resolution was unanimously passed for the purpose of restraining, as far as it may be possible by such means, the ever-growing epidemic of itinerant dental instructors of which this and other communities have for years past been the uncomplaining victims. The society, with a membership of around five hundred, has gone on record as opposed to any form of graduate and postgraduate instruction which is not fostered by an educational institution, a dental society, or a study club composed of members in good standing in their respective dental societies. The itinerant dispenser of so-called dental education is invited to remain as far away as possible from the sphere of influence of the Los Angeles County Dental Society.

The resolution in question reflects the state of mind of those who in the past have been prevailed upon to become members of classes organized for the purpose of improving technical methods or broaden scientific foundations. These courses, with hardly any exception, have been started primarily for the lust of money of their promoters or to further the sale of some dental product, an instance of the latter variety being still vivid in the minds of many dentists of this state. Under the guise of dental missionaries, certain so-called instructors collected fees from dentists for educational services—when, as a matter of fact, the object of the expedition was to stimulate the sale of a certain apparatus, the distribution of which among dentists was not up to that time sufficiently satisfactory to the financial ambition of its manufacturer.

An inquiry into the qualifications, pedagogic and professional, of these self-appointed postgraduate teachers in most instances reveals nothing that by any stretch of the imagination could be construed in the light of a license to impart instruction to undergraduates, to say nothing of graduates of years' standing. Anyone who is not versed in all the scientific principles which constitute the foundation of technical procedures that are to be taught at these pseudo-educational courses should be barred by moral or legal

force from occupying the teacher's platform, and as most of these so-called instructors are bearers of the badge of partial and therefore dangerous culture, their elimination from the educational field will be warmly acclaimed wherever and by whomsoever dentistry is held on a plane of strict professionalism.

A technical procedure, a surgical intervention, a new method of curing (?) pyorrhea, or what not—based upon the evidence of one man's word without other substantiating proofs, clinical, radiographic, bacteriologic, etc., and all of it the outcome of an intelligent analysis of the information available on the main and correlated subjects—cannot be accepted in the light in which they are presented. The perpetrators of such teachings fulfil satisfactorily the requirements of professional piracy.

Postgraduate instruction when it emanates from men who because of their experience, knowledge, and analytical trend of mind have rightfully gained the title of dental teachers is of undoubted value, and adds to the assets of dentistry. When given by those who find in the prospect of material gain the only pretext for pedagogic self-appointment, and who are men of only mediocre cultural or scientific attainments, it drains the resources of dentistry, and sprinkles its escutcheon with one of the most pernicious brands of empiricism.

[*Annals of Surgery*, Philadelphia, March 1919.]

The Formation of Bone. BY LEONARD W. ELY.

This is an attempt on the part of the author to find points of concordance in the data and views of Macewen on the one hand, and of his opponents on the other. Ely decides that only three things are necessary for bone formation: (1) Bloodvessels; (2) either a loose-meshed fibrous tissue or a homogeneous (cartilage matrix) or a granular or a necrotic material; and (3) a stimulus, physiological or pathological. It is this stimulus that causes the bloodvessels to push into the cylinder of cartilage in the first place, and that causes bone formation in the aorta. Ely does not attempt to define the nature of this stimulus or to suggest its mechanism.

Neither periosteum nor marrow is necessary for bone formation, and neither of them "forms" bone, in the proper meaning of that

word. The osteoblast is the bone-building cell. All we can say about the osteoblast is that there is probably such a cell, of unknown derivation, and that possibly the same cell which can build up bone can also tear it down. The opinion Ely has derived from studying his bone slides is that when nature wishes to rearrange the architecture of bones, as after resections or fractures, or on the inside of the cortex in normal growth, she does it with the so-called osteoclasts. When, however, the bone is being absorbed as the result of an inflammatory process in the marrow, the active factor is a small cell, not to be distinguished from the typical osteoblast, and arranged in a row along the trabeculae just like the latter.

[*Annals of Surgery*, Philadelphia, April 1919.]

Osteogenesis. BY L. MAYER.

This paper was written in the hope of adding to our exact knowledge of the fate of the bone graft. The material is valuable as having been derived from human autopsies. However, the results are completely in harmony with earlier (1914) experimental work of the author. In summary, it may be said that the fully developed bone cell has no power of division, and that bone growth results from the activity of cells lying between the bone and the outer layer of the periosteum. When these cells are removed the bone itself is incapable of reproducing them, but the periosteum has that power. In transplantations, the bone graft acts partly as a scaffolding for the ingrowth of osteogenetic cells, but it contributes also its own life, first by the persistence of some of its bone cells, second by the activity of the transplanted periosteum. The graft grows in its new situation, and becomes modified in its form according to changed mechanical conditions. In general, Mayer interprets his observations as a striking negation of Macewen's thesis, and as a corroboration of the classical teachings of Ollier on osteogenesis; viz, that the most important osteogenetic cells are those lying between the outer fibrous layer of the periosteum and the surface of the bone, the so-called cambium layer of the periosteum. Endosteal cells of the marrow cavity and of the Haversian canals are also capable of osteogenesis, though to a diminished degree.

[*British Journal of Dental Science*, London, May 1, 1919.]

Intra-oral Skin Grafting: The Establishment of the Buccal Sulcus. BY H. P. PICKERILL.

It is necessary that there should be adequate buccal and labial sulci in order that both the jaws, lips, tongue, and cheeks should perform their natural and proper functions of both mastication and speech. It is also necessary that adequate sulci should exist in order that functional artificial dentures may be worn. Where from one cause or another (alveolar atrophy, sequent to pyorrhea or disuse; hypertrophied buccal and labial frena; ulcerations with their subsequent adhesions; traumatism, including gunshot wounds) there has been an obliteration of the sulcus, its re-establishment is indicated. Pickerill's method of procedure follows:

(a) When adjacent teeth are present. In this case there is used an appliance similar to a dental splint, carrying an arm attached by screws to the "splint." To the arm is attached a perforated shield, which will approximately fit the sulcus when established. An incision is made dividing the "adhesions," keeping the knife close to the bone. Bleeding is arrested. The shield is covered with modeling compound and an "impression" obtained of the raw area of the sulcus. This is removed. A Thiersch skin graft is cut from the arm or leg and placed raw surface upward upon the impression of the sulcus; it is smoothed down flat and passed up into place and the arm secured by the screw provided. Thus the skin graft is pressed evenly into all the unevennesses of the sulcus, and maintained there with a constant pressure.

(b) When no teeth are present. In this case the procedure is the same in all particulars, except that the "impression" is ligated into place and maintained there with circumferential silkworm-gut ligatures in the lower jaw, or by passing sutures through the palatal muco-periosteum and cheek or lip in the upper jaw.

General or local anesthesia may be used as indicated in each particular case. The appliance is left in position for ten days, then removed and replaced by a permanent or temporary denture or vulcanite shield.

[*Journal of Pharmacology and Experimental Therapeutics*, Baltimore, April 1919.]

Concerning the Action of Local Anesthetics on Striated Muscle. BY SEIKO KUBOTA AND DAVID I. MACHT.

The following local anesthetics, dissolved in Ringer's solution in various concentrations, were employed in these experiments: Cocain hydrochlorid, novocain nitrate, alypin, stovain, beta-eucain, holocain hydrochlorid, phenmethylo (benzyl alcohol, *vide* Macht, *DENTAL COSMOS*, April 1919, p. 339), allocain S, and apothessin. The action of these substances was studied on the excised skeletal muscles of the frog and rat. It was found that all the substances studied depressed the excitability and the contractility of striated muscle, and caused a quicker onset of fatigue. No primary stimulating effect was noted after the exhibition of even very small doses of cocain or other local anesthetics. Of the decomposition products of cocain, ecgonin was found to be a powerful depressant, while benzoyl ecgonin was only very slightly depressant in its action, and sodium benzoate and methyl alcohol produced practically no effect. The stimulating effect of cocain on muscular work cannot be due to its peripheral action on the muscles themselves, but must be ascribed to a central action.

[*Public Health Reports*, Treasury Department, Washington, D. C., May 16, 1919.]

The Saliva in Pellagra. BY M. X. SULLIVAN AND K. K. JONES.

The oral cavity is of importance in the diagnosis of pellagra. The true pellagra tongue is vividly red and more or less swollen. Other parts of the oral cavity are likewise affected. Therefore a reconnaissance survey of the mixed saliva of individual pellagrins was started to determine wherein, if at all, the saliva from a biochemical standpoint differs from that of normal individuals. The study of the saliva included the rate of flow, the specific gravity, the total solids, the ash, the diastatic power, mucin, sulfocyanate, and abnormal constituents, *e.g.*, urea, uric acid, phenols, and indican.

The cases chosen for this study were limited to clinically uncomplicated cases of pellagra. Care was taken to run controls.

The rate of flow of the saliva of pellagra

patients was found to be occasionally very rapid, occasionally very slow, but in general it was well within normal limits. The conclusion must be drawn that the salivation spoken of in the literature as occurring in pellagra is not always a true salivation with a greater volume of saliva, but rather is often an apparent salivation due to some inhibition of swallowing combined with a physical change in the saliva from a non-ropy or slightly ropy, thin-flowing type such as occurs in normal people, to a more ropy kind which makes the presence of saliva in the buccal cavity more obvious.

The specific gravity of the saliva of pellagra patients tends to be higher than that of the controls. The variation for twenty-two cases of pellagra in which the specific gravity was determined was from 1.0024 to 1.0078 (average of 1.004) against an average for the controls of 1.0029.

The total solids, ash, organic matter, and mucin of the saliva are greater for the pellagrins than for the controls, but bear no relation to the mouth symptoms.

The diastatic power of the saliva of pellagrins varies within the limits established by the controls.

The sulfocyanate content is much less marked in the saliva of pellagra patients than in that of normal people. Since it is generally admitted that the sulfocyanate arises from the metabolism of protein and the detoxicating action of the system whereby poisonous cyanids are converted into the relatively innocuous sulfocyanate, the explanation for the lessened sulfocyanate in the saliva of pellagra patients is believed to lie in a lessened protein intake and a detoxicating power feeble than normal. That the low protein intake, or assimilation, is not the only explanation is readily shown by the fact that even on the fairly high protein diet in the hospital the salivary sulfocyanate of the patients is greatly less than normal, and further, one powerfully built, alert, and active normal person living on a generous protein diet rarely showed more than a trace of sulfocyanate in his saliva over a period of three months, and in many tests.

The phenol content of the saliva of pellagrins was sometimes greater than normal, sometimes less. Uric acid was much more evident in the saliva of pellagra patients than

in that of the controls. The reaction of the saliva in pellagra is somewhat more alkaline than is that of normal saliva (using methyl orange and $\pi/10$ H_2SO_4).

[*Transactions of the Southern Surgical Association*, 1917 (per *Cornell University Medical Bulletin*, April 1919).]

Melanotic Sarcoma or Melanoma of Superior Maxilla. BY WM. B. COLEY.

The case is of interest in the first place because of its extreme rarity, and in the second place by reason of the comparatively long duration of the disease before it began to affect the patient's general health, nearly five years intervening between the first and second operations. The total duration of the disease was six years.

Bland Sutton in "Tumors, Innocent and Malignant" reports a case similar to that observed by Coley. The patient, a male of fifty-eight years, had always been in health; shortly after the extraction of two left maxillary teeth a tumor appeared at the same site, which grew at first slowly, and then more rapidly. The tumor was first noticed in the spring of 1911. In February 1912 the first operation was done, a partial resection of the superior maxilla. Radical operation for removal of cervical lymph nodes was refused by the patient. These nodes continued to increase in size, and a few months later a local recurrence took place.

Examination in December 1916 showed a tumor extending from the tip of the external ear on the left nearly to the upper border of the thyroid cartilage, and a little beyond the angle of the jaw and almost to the angle of the mouth. Posteriorly it extended to the sternomastoid muscle. The tumor protruded 2.5 inches beyond the normal surface of the face; irregular and globular in outline, apparently attached to the jaw; firm and fairly movable, with some parts softer than others. Skin normal in appearance except slightly reddened over protuberant part. Intra-buccal examination showed in the left side of the hard palate, near the alveolar process, an opening one inch long and one-half inch wide, leading into the nasal cavity. On the outer and anterior surface of the opening was a black area which appeared to be melanin. This black discoloration led over the alve-

olar process to the mucosa of the cheek, and to the inner side of the lower lip. The left maxillary teeth were lacking. The tonsils appeared normal.

Under ether, the tumor was *almost* completely removed, although it was necessary to leave some tissue for a flap over the deep vessels. About two weeks after the operation administration of mixed toxins was begun, and continued up to the point of producing moderate reactions. Radium emanations 900 mc. were applied (3 mm. lead filter, 3 cm. distance) to the left side of the neck for ten hours. A month later no change in condition was noticed. Radium emanations (platinum and rubber) 96 mc. were applied for two hours.

Neither the toxins nor the radium apparently had any effect at all in checking the growth of the tumor. The patient continued to fail in general health, and the tumor increased rapidly in size, proving fatal five months after the second operation.

[*Proceedings of the Royal Society of Medicine, Section on Odontology*, April and May, 1919.]

Food Deficiencies as a Factor Influencing the Calcification and Fixation of the Teeth. BY F. M. WELLS.

In spite of certain defects of discursiveness and irrelevancy of the title, this article is of some interest. It is a contribution to the much-neglected and highly important study of the influence of systemic conditions upon oral structures and conditions. The author is convinced of post-eruptive metabolic changes of some sort in the enamel (*cf.* Marshall, *DENTAL COSMOS*, 1919, p. 423). The original body of the paper is a report based on histological work carried out on the teeth and jaws obtained from considerably over 100 animals. This work was done by Wells in conjunction with Zilva, and its details are in course of publication *in extenso* by the Royal Society.

For the purpose of this inquiry the mandibular incisors and molars of the guinea-pig were chosen. The teeth while still *in situ* in the mandible were decalcified, and sections were made in an antero-posterior direction parallel to the long axis of the tooth. The animals had been kept on a scorbutic diet. Controls were run. The earliest alteration to

be noticed takes place first in the odontoblasts, in the upper part of the pulp, the decalcification gradually working down to the apex; it is followed by dilatation of the blood-vessels and hemorrhage. The termination is

a very extensive fibroid degeneration of the pulp. Wells has evidence that the pulps of the teeth were affected by the scorbutic diet even before any clinical symptom appeared in any other part of the system.

PERISCOPE

Matrix for Boxing the Impression.—

Take a strip of muslin or some other piece of heavy cloth that has very little lint on its surface, dip it in melted wax until saturated, and allow it to cool. When needed, a piece of the desired length and width may be cut off and placed around the impression or tray, to which it can be very easily adapted. The plaster or other cast materials will not adhere to such a band.—F. W. FRAHM, *Pacific Dental Gazette*.

Aphthous Stomatitis.—Aphthous stomatitis, or canker sores, are perhaps the most common lesions found in the mouth, and may be important as the possible starting-point of cancer, especially if they are "touched up" with silver nitrate, as is so commonly the practice, but which should never be done. They are the result of disordered digestion, and some persons have repeated attacks with each recurrent stomach derangement. They are commonly multiple, round or oval, inflammatory in character, with superficial ulceration, appearing suddenly with some little soreness. They usually disappear soon after the patient is placed under proper digestive treatment, with a mild mouthwash of sodium bicarbonate, and frequent touching of the spots with burnt-alum powder, applied with the moistened finger. If one or more of them persist it is always well to consider the possibility of its being a true cancer.—L. DUNCAN BULKLEY, *Pacific Dental Gazette*.

A One-piece Backing for Steele's Facings.—The advantages of the following method are—(1) It is quickly made. (2) It is a one-piece backing, and there are no rivets to avoid in letting down the tooth.

Cut a piece of No. 31 American gage or .009 crown gold, as long as the tooth to be backed and a little wider.

Take an inch of .021 wire (Gunthorpe's gold-cased, extra-thin size wire is the right size). Bend the gold over the wire and grip

the ends in a hand-vise; still holding the gold in the vise, nip it close up to the wire with a pair of cutting pliers. Remove the vise, hold the gold with the cutting pliers, bend the flaps back, and tap them straight with a riveting hammer. Remove the wire, file away the gold bar thus formed so as to allow the backing to extend a line past the edge of the tooth. Burnish the gold to fit the tooth.

I find it saves fitting if the soldering is done with the tooth in place, and as no metal is incorporated in the porcelain there is very little risk of checking the tooth.—A. G. ATTENBOROUGH, *British Dental Journal*.

A Case of Antral Abscess Treated with Salicylic Acid.

Antral abscess is often a very troublesome condition, and the following long-standing case in which the treatment adopted proved efficacious in stopping the discharge may prove suggestive: The patient was an elderly lady with an abscess of the antrum which had existed for fourteen years. During this time the tube had been removed every night and morning, and the cavity syringed with an antiseptic solution. Guided by the principle that all chronic discharging surfaces should be kept dry, and knowing that salicylic acid is one of the most powerful bactericides we possess, I treated her by plugging the antrum with a piece of gauze into which I had rubbed a powder consisting of salicylic acid 1 part and sacch. alb. 4 parts. This was passed loosely into the cavity and renewed daily. On the fourth day the discharge had ceased. Treatment was then suspended, a piece of cotton being placed over the opening of the sinus, which was kept in position by the denture the patient was wearing. The treatment was effective. Three months later the patient reported that she had had no further trouble from the day of the last plugging.—PERCY R. WILDE, *Lancet* (per *Austral. Journ. of Dentistry*).

Case of Dentigerous Cyst in Connection with Third Mandibular Molar.—

Mrs. B., age twenty-three, consulted me with reference to a swelling on the left side of the mandible. On making an examination I found that the third molar was missing, although the other three were normally erupted. The swelling was rounded, and extended from the first premolar to about half-way up the ascending ramus, involving the whole of the bone in this region. It was quite hard except just behind the second molar (the roots of which on extraction were found to be absorbed), where fluctuation could be detected. X-ray examination showed the third molar situated very near the angle, with one of its roots penetrating the under surface of the mandible.

On opening up the cyst under a general anesthetic the tooth was found to be very firmly implanted in the remaining bone, and a fracture was anticipated. This, however, did not happen, although a double dislocation occurred which was easily reduced. On examination the tooth was found to have four roots, situated in pairs, internal and external to the arch, the inner surfaces of which were deeply grooved in such a way that the inferior dental nerve and artery passed through, showing that these must have been forced almost to the outside of the mandible.

After the extraction of the tooth, which took about fifteen minutes, the cyst was scraped and packed with gauze.—W. ASHLEY COOPER, *British Dental Journal*.

The Standardizing of the Color of Teeth by the Classification of People into Types and Classes.—

I believe this can be done, and that it will be done in the near future. And I believe that the possibility for advance in the improvement in the colors of artificial teeth, based on the ascertained colors of natural teeth described by scientific nomenclature, are as great as were the possibilities for improvement in form ten years ago. I have said that scientific methods of color analysis can help us but very little in perfecting a color scheme for artificial teeth, because that color scheme must be perfected entirely by experimental methods which have scarcely anything in common with the scientific procedure of color analysis. But before we can know what we want for color in artificial teeth, we must first know what the colors are in natural teeth, and I have no doubt these essential primary facts can be ascertained by systems of color analysis now in use. These facts once in hand, there must follow a long series of experiments with the few mineral colors available in the effort to match the colors we have found in the nat-

ural teeth. The crux of this whole difficult problem lies in the perfecting of a set of color symbols which will at once and at the same time stand for the color of natural teeth as expressed by the results of a system of color analysis analogous to spectrum analysis and the results of a purely empirical or experimental method with mineral pigments. This is not an easy matter, but I believe the thing can be done. It must be done if we are to achieve entirely satisfactory results, and I hope Dr. Orton will be able to work out a set of symbols which will help us to accomplish this great advance.—J. LEON WILLIAMS, *Dental Digest*.

Surgery in Edentulous Mouths.—Many edentulous mouths present conditions that are unfavorable for successful denture-building, both as to comfort and esthetic appearance. Large projections of bone may interfere or make it impossible to place teeth of proper length in the correct positions for facial harmony and perfect articulation. Cysts, granulomas, areas of necrotic bone, and fragments of tooth roots are always found, and are the cause of absorption and those troublesome sore spots that are so hard to relieve. A most unfavorable case is one in which the ridge, especially the upper, is too thick in its labio-lingual or bucco-lingual measurements, thereby making it impossible to place teeth of sufficient ridge-lap and size far enough in on the ridges to properly articulate with the lower, and avoid showing too much rubber. The surgery in these cases will depend upon the amount of pathology found and the size and shape of the patient's mouth.

In the troublesome soft-ridge cases painstaking efforts should be made to ascertain all possible causes. The radiograph will generally reveal the shape of the ridge, that is, whether it is thin and sharp or thick and rounded; it will also reveal areas of necrotic bone and fragments of roots, granulomas, or cystic material. A Wassermann test and one for pernicious malaria should be considered. If the patient is wearing dentures the articulation should be studied for possible traumatic influences, which will generally be found associated with the present method of occluding teeth instead of the more scientific articulation methods. The mere incising of a section of soft tissue does not always cure the condition, as the cause is not removed. In reality it is only treating the symptoms, which may return, and in a few years the mouth presents the typical class IV case described by Mr. Samuel Supplee.—WM. A. COLBURN, *Pacific Dental Gazette*.

The Articulator for Crown and Bridge Work.—All cases of bridge work, especially those involving the posterior teeth, should be constructed upon casts that have been extended far enough to obtain a balanced articulation and then mounted upon an articulator, and not upon one of those small hinge affairs frequently called crown bridge articulators. This latter class of appliance does not afford lateral movements. Many of the failures in this work can be directly attributed to faulty articulation due to incorrect mounting of poor casts upon pseudo-articulators.—F. W. FRAHM, *Pacific Dental Gazette*.

A Case of Iritis Due to Third Molar Impaction.—The case history of Mr. C. P., age forty-two. In August 1917, the patient had a severe attack of iritis and neuralgia of the left side of the face, head, neck, and shoulder. Oculist's treatment: Sodium salicylate, atropin in eye—two injections of strepto-staphylococcus vaccine. The attack lasted three weeks. He then suffered a nervous breakdown, and was sent to the country for two months to recuperate. He recovered slowly.

In February 1918, a second attack occurred, which commenced after he had been exposed to cold. The attack lasted a week. Treatment as in first attack, but instead of vaccine he was given intravenous injection of some other remedy. He had no history of lues. Two Wassermann tests were made, both negative.

At this time he was referred to the writer. Skiagrams were taken of both dental arches. This revealed an impacted third molar in the upper left arch. He was advised to have it removed, but refused such treatment. In September 1918, he again suffered an attack. After having been in bed about a week he presented himself to have the impacted tooth removed.

It was decided to remove both the second and third molars under infiltration anesthesia. Within twelve hours afterward the iritis subsided, and in a week the neuralgia had disappeared.

To date there has been no recurrence of the disorder.—T. I. LEICHE, *Internat. Journ. of Orthodontia*.

Tragedies of the Profession.—There are many cases where operations have resulted directly or indirectly in the death of the

patient, but the deaths occurring in the cases of the operators themselves are, happily, not many, and the most of them might have been averted had reasonable care been taken at the time of their occurring.

About three years ago, in the city of Portland, Oregon, an operator was engaged in the work of opening and cleansing a putrescent root-canal. He was using a Gates-Glidden drill, and like a thousand other men who do the same work day after day in their practice, left the drill in the handpiece dangling at the end of the engine arm. Reaching for an antiseptic in his case, he inadvertently raised his knee and struck the end of the drill with sufficient force to have it pierce his clothing, and enter his leg just above the knee. Impatiently he thrust it aside, little dreaming of the results impending. Three hours afterward he was in an agony of pain, and later was taken to the hospital, where he died within twenty hours from the time he was struck. The poison from a rattler's fang would have hardly worked more quickly.

Dr. M., of Reno, Nev., was suffering one winter's day from a severe cold in his head, which had broken out in a rash or abrasion on the edges of his nostril. Some time during the day's work he had been handling a patient suffering from virulent syphilis, and at the end of two weeks the unfortunate doctor was a victim to that dreadful scourge. Unfortunately, he was in a poor state of health at the time; in fact, he had sought the high altitude of Nevada on account of the condition of his lungs. His system could not stand the task of throwing off the two poisons, and Dr. M. died, horribly diseased. He had unwittingly introduced the germ of syphilis to the abrasion on his nose.

A new assistant, poorly versed in her duties, a busy practitioner, and another Gates-Glidden drill that had not been sterilized, was the cause of the death of another operator of Anaconda, Mont. It seems that the assistant, instead of sterilizing the instruments she had found on the operating table, had picked up a drill that had been in use, and had put it in the bur stand remaining on the table. Dr. S., reaching across the table to pick up an instrument, had pricked his hand with the point of the drill. Blood poisoning set in, and the loss of the arm first did not stem the course of the poison: he had to yield his life to its ravages.—GRAY MCCLINTOCK, *Dominion Dental Journal*.

OBITUARY

Dr. Harry Stewart Haslett.

[SEE FRONTISPIECE.]

DIED, Friday, January 17, 1919, at his home in Pittsburgh, Pa., of Bright's disease, HARRY STEWART HASLETT, D.D.S.

Dr. Haslett was born in Pittsburgh, February 5, 1867, his father being an engineer of that city. He received his early education in the Allegheny high school and at Geneva College; entered the Pennsylvania College of Dental Surgery in 1894, and received the D.D.S. degree from that institution in 1896. Immediately after his graduation, he began the practice of his profession in Pittsburgh, and continued in practice until the time of his death.

Dr. Haslett was appointed professor of prosthetic dentistry, anesthesia, and extracting in the Department of Dentistry of the University of Pittsburgh in 1904, which position he occupied until the time of his death. He was unusually successful as a teacher, being revered by his students, and on many occasions his valued counsel was sought by both his students and his immediate associates. Only those who came within the influence of Dr. Haslett's quiet, genial personality can appreciate the sense of loss which the profession and the dental teaching bodies feel in his death.

Dr. Haslett was a member and ex-president of the Odontological Society of Western Pennsylvania; a member of the Lake Erie Dental Society, the Pennsylvania State Dental Society, the National Dental Association, and the American Institute of Dental Teachers. He was also a member of the Bellefield Masonic Lodge and of the Psi Omega Dental Fraternity, having served as Grand Master in the latter organization.

He was married in 1888 to Miss Dollie Buttress of Pittsburgh, who, with one son, Dr. Clyde S. Haslett, survives him. His remains were interred in Highwood Cemetery, Pittsburgh, Pa., January 20, 1919.

Dr. Michael J. Collins.

DIED, at his home, Bangor, Me., April 1, 1919, after a brief illness, MICHAEL J. COLLINS, D.D.S.

Dr. Collins was born in Bangor, Me., on the fourth day of June 1870, the son of John and Matilda (Burke) Collins. He was educated in the public schools of Bangor, and for a short time thereafter he was connected with the Maine Central Railroad Co. From his early boyhood, Dr. Collins was ambitious of becoming a dental surgeon, and entered the Philadelphia Dental College, from which institution he was graduated with the D.D.S. degree in 1895. Immediately after his graduation he commenced the practice of his profession in Bangor, where he arose very rapidly to an enviable position as a dental practitioner.

He was a devout member of St. Mary's Catholic Church of Bangor; an honorary member of St. Mary's Charitable Society; a member of the Local Council of the Knights of Columbus, and a member of the Bangor Lodge of Elks. He was for many years a member of the Penobscot Dental Society, taking an active interest in the affairs of the society, and on several occasions read papers at its meetings which received most favorable comment from those who had the privilege of hearing them.

Dr. Collins was married on June 26, 1901, to Miss Elizabeth A. Gillis of Bangor, who with six children survives him.

DENTAL LEGISLATION

The New Dental Law of Minnesota.

CHAPTER 386—S. F. No. 466.

AN ACT

TO AMEND SECTIONS 5015, 5016, 5017, 5018, 5019, 5020, AND 5021, GENERAL STATUTES OF MINNESOTA FOR THE YEAR 1913, RELATING TO THE POWERS AND DUTIES OF THE STATE BOARD OF DENTAL EXAMINERS AND THE LICENSING OF DENTISTS AND THE PRACTICING OF DENTISTRY AND FIXING OF THE FEES TO BE CHARGED THEREFOR IN THE STATE OF MINNESOTA, AND PROVIDING PENALTIES FOR THE VIOLATION THEREOF, AND PROVIDING FOR THE MANNER OF TAKING APPEALS FROM ORDERS MADE BY THE BOARD OF DENTAL EXAMINERS.

Be it enacted by the Legislature of the State of Minnesota:

SECTION 1. *Board of Dental Examiners.—Appointment.* That Section 5015, General Statutes of Minnesota for the year 1913, be amended so as to read as follows:

The Board of Dental Examiners shall consist of five practicing dentists of the state appointed by the Governor, each for the term of three years and until his successor qualifies, and no member shall serve more than two successive terms; provided, however, that up to and including December 31, 1919, the board shall consist of six such practicing dentists. The board shall at all times include four members who shall have been appointed on the recommendation of the Minnesota State Dental Association, if such recommendation be made at least ninety days before the term of the member of that class expires, otherwise the Governor may appoint without such recommendation. Every vacancy caused otherwise than by the expiration of a term shall be filled in the same manner and from the class to which the retiring member belongs. If the association is entitled to and fails to recommend a candidate for such unexpired term within thirty days after the vacancy occurs the Governor may appoint without such recommendation. If a member

shall be absent from two consecutive regular meetings, the board shall declare a vacancy to exist. The association shall recommend not less than two candidates for each appointment.

SEC. 2. *Officers—Meetings—Compensation—Reports.* That Section 5016, General Statutes of Minnesota for the year 1913, be amended so as to read as follows:

The board shall elect from its members a president and secretary and treasurer, and shall have a common seal. It shall hold at least two regular meetings each year at times to be fixed by the board, and may hold special meetings as occasion demands. All meetings shall be held at the College of Dentistry of the State University. Out of the funds coming into the possession of said board, the members thereof shall receive as compensation the sum of ten (\$10.00) dollars per day and necessary traveling expenses for each day actually engaged in the duties of their offices as examiners. The secretary shall in addition thereto be paid a salary to be fixed by resolution by the board, which up to January 1, 1920, shall not exceed five hundred (\$500) dollars per year, and thereafter shall not exceed nine hundred (\$900) dollars per year. All moneys received by said board in excess of the expenditures for per diem allowance, traveling expenses and salary of the secretary, as above provided for, shall be held by the secretary of said board as a special fund for printing, postage, and other necessary expenses of the board for carrying out the provisions of this Act. The secretary of the board shall give a bond in an amount to be fixed by resolution of the board, and in form to be approved by the Attorney-general conditioned for the faithful discharge of his official duties.

Before December 15th of each year the board shall report its proceedings and the items of its receipts and disbursements to and in form to be approved by the Governor of the State of Minnesota.

SEC. 3. *Dentistry—Practicing of, defined.* That Section 5017, General Statutes of Minnesota for the year 1913, be amended so as to read as follows:

All persons shall be said to be practicing dentistry within the meaning of this Act, who shall do any of the acts comprehended within any or all of the following subdivisions:

1. Using or permitting to be used, the word or letters "Dentist" or "D.D.S.", "D.M.D.", or any other words or letters in connection with his name which in any manner represents him as engaged in the practice of dentistry.

2. By himself, or his servants or agents, operating or conducting a place wherein dental examinations, operations, or acts prescribed in clause 4 hereof are performed or attempted to be performed or advertised as a place where they are performed or attempted to be performed.

3. By himself, or his servants or agents, advertising or permitting to be advertised by sign, circular or handbill, newspaper, or otherwise, that he will perform or attempt to perform any of the dental examinations, operations, or acts prescribed in clause 4 hereof.

4. By himself, his servants or agents and for a fee, salary, or other reward paid or to be paid either to himself or to any other person for him diagnose, treat, operate or prescribe for, or attempt to diagnose, treat, operate or prescribe for any disease, lesion, pain, injury, defect, deformity or physical condition of the human teeth, alveolar process, gums, or jaws, or replace teeth by artificial ones, or correct malpositions thereof.

Provided, however, that this section—

A. Shall not prohibit non-licensed persons from doing mechanical work upon inert matter in dental offices or laboratories.

B. Shall not apply to students enrolled in and regularly attending any dental college recognized by the State Board of Dental Examiners, provided their acts are done in said dental college and under the direct supervision of their instructor.

C. Shall not apply to a legally qualified and licensed physician or surgeon in the performance of surgical operations or who in emergency cases extracts teeth or relieves pain or prescribes for the relief of pain.

D. Shall not apply to licensed or registered dentists of another state temporarily operating a clinic under the auspices of a duly organized and reputable dental college, or reputable dental society, or to one lecturing

before a reputable society composed exclusively of dentists.

E. Shall not apply to licensed dental nurses in the performance of their duties as provided by law.

In the construction of this section, the word "person" shall be deemed to include all individuals, corporations, or associations. The word "himself" shall be construed to include "herself," "themselves," or "itself." The word "his" shall be construed to include "her," "them," or "it." The singular shall include the plural.

F. Shall not apply to any person who ministers to or treats the sick or suffering by mental or spiritual means, whether gratuitously or for compensation, without the use of any drug or material remedy.

SEC. 4. *Examinations—License—Revocation—Assumed name.* That Section 5018, General Statutes of Minnesota for the year 1913, be amended so as to read as follows:

A person not already a licensed dentist of the state desiring to practice dentistry therein shall apply to the secretary of the board for examination and pay a fee of twenty-five (\$25.00) dollars for the first examination and (\$25.00) dollars for each subsequent examination, which in no case shall be refunded. At the next regular meeting he shall present himself for examination and produce his diploma from some dental college of good standing, of which standing the board shall be the judges, also satisfactory evidence showing that the applicant is of good moral character. The board shall give the applicant such an elementary practical examination as to thoroughly test his fitness for the practice and include therein the subjects of anatomy, physiology, chemistry, materia medica, therapeutics, metallurgy, histology, pathology, and operative, surgical, and mechanical dentistry; and the applicant shall be required to demonstrate his skill in operative and mechanical dentistry. If the applicant successfully passes the examination, he shall be registered by the board as a licensed dentist, and supplied with a license signed by all members of the Board of Dental Examiners.

Provided that any dentist who has for five years or more been in legal practice in another state having and maintaining an equal standard of laws regulating the practice of dentistry with this state, including reciprocity provisions, and is a reputable dentist of good moral character, and is desirous of removing to this state, and deposits in person with the Board of Dental Examiners a certificate from the examining board of the state in which he

is registered, certifying to the fact of his registration and that he is of good moral character and professional attainments, and upon payment of a fee of fifty (\$50.00) dollars, may, at the discretion of the board, be granted a license to practice in this state without further theoretical examination.

The Board of Dental Examiners may upon written charges filed and after hearing had thereon after twenty days' written notice thereof to the accused, served either personally or by registered mail, addressed to the accused at his last address as known to the Board of Dental Examiners, and in such case also publishing a copy of the notice once a week for two consecutive weeks in a legal newspaper published in the village, town, or city wherein the accused last resided to the knowledge of the Board of Dental Examiners, suspend or revoke a license obtained by fraud or misrepresentation, or the license of any dentist found guilty of violating this Act by a court of competent jurisdiction, or convicted subsequent to the date of his license of a misdemeanor involving moral turpitude or of a felony, or who becomes habitually intemperate or addicted to drugs, or is guilty of gross immorality, or advertises with a view of deceiving or defrauding the public, or is not otherwise of good moral and upright character.

Provided, however, if any person is aggrieved by any order of said board he may appeal from any such order to the district court of the county in which he resides within thirty days after notice from the board of the filing of said order. The notice of appeal shall state that he appeals to the district court of the county wherein he resides, and said notice shall be signed by the person appealing or his attorney, a copy of which notice shall be mailed to the secretary of said board at St. Paul, Minnesota, by registered mail at the usual postoffice of the person appealing, or his attorney. Said notice of appeal, with proof of mailing of a copy thereof to the secretary of said board, registered as aforesaid, shall be filed in the office of the clerk of the district court of said county within ten days after mailing thereof, and such appeal shall suspend operation of the order appealed from until the appeal is finally determined. The trial of all issues on such appeal shall be *de novo* by the court, and such appeal shall be heard and tried in the same manner as other issues of law and fact are heard and tried in such court, and the order appealed from shall have no force or effect in the determination of such appeal. The district court shall hear and determine

the appeal within ten days or as soon thereafter as possible from the date of the filing of the proof of mailing of said notice of appeal, at any place in the judicial district to be designated by any of the judges of said court. Upon the trial of said appeal the court may confirm, reverse, or modify any order of said board appealed from.

A stenographic record shall be kept of all such proceedings.

In such proceedings the Board of Dental Examiners shall have power to compel the attendance of witnesses by subpoena and to compel the giving of testimony under oath.

Any dentist whose license has been suspended or revoked may be reinstated and a new license issued to him when in the judgment of the Board of Dental Examiners such action is warranted, provided such reinstated dentist shall pay all the costs of the proceedings resulting in his suspension and reinstatement and in addition thereto a fee of twenty-five (\$25.00) dollars.

Within ninety (90) days after the passage of this Act the secretary of the Board of Dental Examiners shall file with the Secretary of State a complete list of all licenses heretofore issued and remaining unrevoked by the State Board of Dental Examiners. The secretary of said Board of Dental Examiners shall likewise notify the Secretary of State of any licenses subsequently issued or revoked within ten (10) days after issuance or revocation by the State Board of Dental Examiners. Said name so filed with the Secretary of State shall be listed by the latter on a book kept for that purpose.

SEC. 5. *Annual Fee.* That Section 5020, General Statutes of Minnesota for the year 1913, be amended so as to read as follows:

Before the 1st of May in each year every licensed dentist shall pay to the board a license fee of one (\$1.00) dollar, and in default of such payment the board may, upon hearing and upon twenty (20) days' notice, revoke the license of the dentist in default; but the payment of such fee on or before the time of hearing, with such additional sum, not exceeding five (\$5.00) dollars, as may be fixed by the board, shall excuse the default. The board may collect such fee by suit.

In case of a lost license, and satisfactory proof of the loss or destruction thereof being furnished to the board, the latter may issue a duplicate license, charging a fee therefor of one (\$1.00) dollar.

SEC. 6. *Prohibition — Penalties — Disposition of Fines.* That Section 5021, General

Statutes of Minnesota for the year 1913, be amended so as to read as follows:

Any person, firm, association, or corporation, found guilty of any of the following acts, shall be deemed guilty of a misdemeanor, and in this connection all officers, agents or employes of a corporation or association participating therein shall be likewise guilty of a misdemeanor:

1. Practicing dentistry as in this law defined without being first duly licensed.

2. Owning, running, operating, or conducting any room or rooms, office, or dental parlors, where dentistry is practiced as defined in this Act, or where dental work of any kind is done or performed or contracted for, wherein an unlicensed person is practicing dentistry contrary to the provisions of this law.

3. Falsely pretending that he holds a license to practice dentistry in this or any other state or country.

4. Practicing or offering to practice, or hold oneself out as practicing dentistry under any name except his or her own proper name, which shall be the name used in his or her license granted to him or her as a dentist, as provided for in this article. Using the name of any company, association, corporation, trade name, or business name in connection with the practice of dentistry as defined in this law.

5. Operating, managing, or being employed in any room or rooms or office where dental work is done or contracted for, or advertised to be done, where solicitors are employed.

6. Making any wilfully false statement in any affidavit or other statement required by the Board of Dental Examiners of any applicant for a license.

It shall be no defense for a person prosecuted for practicing dentistry under one name, without a license, that he shall have been licensed under a different name, unless it shall be shown that such practice was without intent to defraud or deceive.

Whoever shall be convicted of a misdemeanor for a violation of any of the provisions of this Act shall be punished for the first offense by imprisonment in the county jail for not more than three (3) months, or by a fine of not more than one hundred (\$100.00) dollars. For each conviction subsequent to the first—as to any corporation, by a fine of one hundred (\$100.00) dollars, and as to any individual, by imprisonment in the county jail for not less than thirty (30) days nor more than three months.

All fines collected under the provisions hereof shall be paid into the school fund of

the county in which the conviction occurred. The Board of Dental Examiners may, when it deems best for the enforcement of this law, employ such attorney as the Attorney-general shall appoint, the compensation of such attorney to be paid out of the funds of the Board of Dental Examiners.

SEC. 7. It shall be unlawful for any dentist to divide fees with, or to promise to pay a part of his fee to, or to pay a commission to any other dentist who calls him in consultation or sends patients to him for treatment or operation, but nothing herein shall prevent licensed dentists forming a partnership for the practice of dentistry, nor to the regular employment of a licensed dentist by another licensed dentist. Any dentist violating this section shall be guilty of a misdemeanor and shall be punished by a fine of not to exceed one hundred (\$100.00) dollars, or imprisonment in the county jail not to exceed ninety (90) days.

SEC. 8. Provided that the provisions of this Act shall not apply to persons unlawfully engaged in the business or practice of dentistry at the present time.

Approved April 23, 1919.

AN ACT

TO PROVIDE FOR THE LICENSING OF DENTAL NURSES AND PROVIDING THE DUTIES AND RIGHTS OF DENTAL NURSES.

Be it enacted by the Legislature of the State of Minnesota:

SECTION 1. *Who May Become a Dental Nurse.* Any woman of good moral character, having a high school education and being twenty years of age or over, who is a graduate of a training school for dental nurses requiring a course of not less than two academic years, and approved by the Board of Dental Examiners, or who is a graduate of a training school for nurses and has received at least three (3) months' clinical training in dental hygiene in any approved training school for dental nurses, may upon payment of ten (\$10.00) dollars be examined by said board on the subjects considered essential by it for a dental nurse. Such examination may, in the discretion of the board, be conducted by a part of the members of the board. If the applicant, in the opinion of the board, successfully passes said examination, she shall be registered and licensed as a dental nurse. Any woman of good moral character and twenty years of age or more, who before June 1, 1919, shall register her name with the State Board of Dental Examiners, may upon show-

ing three (3) years' actual experience in the office of a licensed dentist, and upon complying with such requirements and passing such examinations as the Board of Dental Examiners shall require, be licensed as a dental nurse.

SEC. 2. *Employment of and Practice by Dental Nurses.* Any licensed dentist, public institution, or school authorities may employ such licensed dental nurse. Such dental nurse may remove lime deposits, accretions, and stains from the exposed surfaces of the teeth, and administer gas, ether, and anesthesia as applied to dentistry, but shall not perform any other operation on the teeth or tissues of the mouth. She may operate in the office of any licensed dentist or in any public institution, or in the schools, under the general direction or supervision of a licensed dentist. The Board of Dental Examiners may suspend or revoke, with power to reinstate, the license of any licensed dentist who shall permit any dental nurse operating under his supervision, to perform any operation other than that permitted under the provisions of this section, and it may also suspend or revoke, with power of reinstatement, the license of any dental nurse violating the provisions of this Act. The procedure to be followed in the case of such suspension, revocation, or reinstatement, shall be the same as that prescribed by law in the case of suspensions, revocation, or reinstatement of a licensed dentist.

SEC. 3. *Payments to be made to Board of Dental Examiners.* Before the 1st of May in each year, every licensed dental nurse shall pay to the Board of Dental Examiners a license fee of one (\$1.00) dollar, and in default

of such payment, the board may upon hearing and upon twenty (20) days' notice revoke the license of the nurse in default, but the payment of such on or before the time of hearing, with such additional sum not exceeding five (\$5.00) dollars, as may be fixed by the board, shall excuse any default. The board may collect such fee by suit.

SEC. 4. *Licensing of Dental Nurses Authorized by Another State.* Any female dental nurse or dental hygienist duly licensed to practice as such in another state having and maintaining an equal standard of laws regulating the practice of dental nurses with this state, and who is of good moral character, and is desirous of removing to this state, and deposits in person with the Board of Dental Examiners a certificate from the examining board of the state in which she is licensed, certifying to the fact of her being licensed and that she is of good moral character and professional attainments, may upon the payment of a fee of twenty (\$20.00) dollars, at the discretion of the board, be granted a license to practice in this state without further examination. As to any person so applying and who has been licensed in a state not maintaining an equal standard of laws within this state, the board may license such person upon the payment of the fee above provided for, furnishing the same evidence as to licensing, good moral character, and professional attainments, and passing such further examination as the Board of Dental Examiners shall deem necessary.

SEC. 5. This Act shall take effect from and after its passage.

Approved April 15, 1919.

DENTAL COLLEGE COMMENCEMENTS

Dalhousie University, Dental Department.

At the annual commencement exercises of the Faculty of Dentistry of Dalhousie University, held in Halifax, N. S., the degree of Doctor of Dental Surgery was conferred on the following graduates:

Michael C. Connors Nova Scotia
Karl K. Dimock Nova Scotia
William L. Gillespie New Brunswick

Arabelle C. MacD. Mackenzie. Nova Scotia
Frank C. Thomas New Brunswick

College of Physicians and Surgeons.

THE annual commencement exercises of the Dental Department of the College of Physicians and Surgeons of San Francisco were held on Thursday, May 22, 1919, in San Francisco, Calif.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Harold E. Arnold	Isidor A. Feldman	Harold J. McGillvray	Alexander H. Rowe
Herbert S. Behring	Ludolf W. Folkers	Cuthbert E. Malm	Floyd F. Scott
Grover F. Bowman	Walter I. Frank	John G. Mitchell	Rainer O. Seffer
Carlos L. Bustamante	Frank J. Gehres	Ivan L. Morton	Louis F. Shade
Edwin A. Carmichael	Paul H. Gilbert	Leon W. Moser	William C. Stradling
C. Walter Cole	Walter A. Goff	Lionel C. Murphy	Walter P. Strycker
Hylas L. Dahl	John H. Gold	Eugene P. Nicolas	Archibald W. Sweasey
Frank A. Daneri	Walter M. Goldberg	Chotoku Nishi	George B. Todd
Earl F. Davison	James A. Graham	Elmer P. Norwall	Richmond J. Tormey
Francis J. De Borba	Robert Grosso	Leslie L. Parkinson	Arthur B. Van Valin
Cesare De Luchi	Milton A. Groth	Manuel Pereyra	Walter B. Varey
D. Leslie Durst	Shuji Honma	Arthur A. Priest	John M. Westbie
Herbert G. Eades	Robert C. Jackson	Alan McD. Robinson	James K. Westerfield
James M. Feeny	Edwin E. Kendall	Erle C. Rogers	Carl V. Whited

Marquette University, School of Dentistry.

At the annual commencement exercises of the School of Dentistry of Marquette University, held in Milwaukee, Wis., the degree of Doctor of Dental Surgery was conferred on the following graduates:

Arthur C. Akey	Bruce Forster	Harry Leviash	R. J. Pflum
Alfonse Albert	R. O. Frohman	Harry E. Lipp	E. J. Pinter
Edwin B. Anderson	N. C. Garling	Ed. Lyon	R. P. Phelan
James R. Baer	M. J. Goblirsch	Elmer W. Lyon	Alfred Probst
Harry S. Bailey	Samuel Granofsky	W. E. Lusk	H. F. Radtke
Arthur C. Barry	J. Walter Grassl	S. C. McCaul	A. M. Riedel
Oliver H. Bauman	Chas. H. Hanger	R. McCormick	C. R. Rumsey
Wm. F. E. Berndt	Roy V. Harte	Wm. L. McDonald	R. C. Rupert
Henry G. Bleier	B. A. Heffernan	Lloyd McCrary	A. E. Russell
Leo O. Bloom	Glen F. Heggy	F. A. McKillip	A. C. Sandner
Edward J. Bolinske	Elmer M. Hein	J. McLane, Jr.	M. Sargent
Francis M. Boyle	C. L. Henneman	E. J. McLeod	R. F. Scherer
Sheridan Byrne	Harry J. Hodgkin	U. J. McNally	M. Schleuter
Calvert B. Cain	Allen M. Howard	Myrtle F. Maas	W. J. Schleiss
Bryant G. Cameron	J. B. Houlehan	John Macioseck	H. R. Schlossman
Sylvester J. Campion	R. Ihlenfeld	O. S. Marsh	G. Schmutzler
Arthur F. Carey	Toraehiki, Ito	Edw. F. Miller	E. Schuette
Gall F. Carrigan	Robert Jenkins	C. H. Minette	E. L. Seбора
Lawrence A. Carroll	J. M. Johnston	V. W. Moore	E. C. Segers
J. A. Cooney	Wm. Just	A. L. Moses	Joseph Seidelman
Russell E. Cooper	N. P. Kelley	J. Motolet	W. L. Seng
Rudolph A. Docter	Walter A. Kelly	J. W. Murphy	E. P. Sloan
Chas. E. Doyle	Wm. A. Kern	L. J. Murphy	G. A. Spandico
Gilbert Droegkamp	C. J. Kirwan	Bert Myra	Percey Sterz
Terry L. Durner	R. Klaeser	O. T. Nestingen	Myra Thewalt
Oliver Edwards	Raymond O. Klink	A. J. Noetzel	A. H. Toennessen
Warren E. Emerson	Edw. H. Knittel	L. J. O'Brien	Wm. Toutant
Rufus O. Erickson	L. Chas. Komers	J. H. O'Connell	W. Townsend
M. F. Eusterman	Lorraine E. Kress	Amil Olson	E. C. Voelker
Hugh R. Evans	John M. Kropp	L. K. Patterson	J. E. Watt
R. R. Evans	H. C. Krueger	H. F. Peck	C. O. Westcott
Harry G. Farrell	Victor Kulnick	P. O. Pederson	P. R. Wiesler
Arnold M. Fawcett	L. F. Larson	A. J. Peetz	Elmer Williams
Jack H. Fink	O. H. Lentzner	A. S. Pflum	E. D. Wyrobeck
Herbert C. Flynn	Chas. O. Leidgen	Edw. A. Pflum	

Western Reserve University, School of Dentistry.

At the annual commencement exercises of the School of Dentistry of Western Reserve University, held in Cleveland, Ohio, 1919, the degree of Doctor of Dental Surgery was conferred on the following graduates:

Paul M. Austin	Orlo S. Gebert	James F. McCann	Marty R. Seaman
Arvey J. Beck	Israel A. Gleisser	Ray R. Mason	Frank H. Simmerly
Paul E. Bennett	Harold W. Gohr	John W. Nehrenz	Daniel J. Smally
Birdsill H. Broadbent	Milton M. Guzik	Fred C. Nelson	Earl S. Snyder
Foster B. Brown	Harold R. Hall	Frank M. Novak	George S. Thompson
Anna L. Buntin	Henry G. Hoffner	Alan C. Oldenburg	Lada J. Turek
Don A. Crawford	Leon J. Kinsley	William D. Parsons	Scholastica U. Twarogowski
William C. Davis, Jr.	John J. Kirk	Samuel Pines	Milton M. Weinberg
Merton F. Elliott	Sylvester Krewson	Charles Robinson	Leon M. Wiesstien
Patrick E. Faragher	Paul W. Krukenberg	H. Albion Rood	Macey Wolf
Serena Friedman	Milton Lieberman	Wilbur D. Samuels	Frank A. Yocum
Joseph H. Gallagher	Leon A. Luttenton	William E. Schoren	

Creighton University, Dental Department.

At the annual commencement exercises of the Dental Department of the Creighton University, held in Omaha, Nebr., the degree of Doctor of Dental Surgery was conferred on the following graduates:

Louis C. Barstow	Frank P. Ellenberger	William J. Korbel	Frank W. Rapp
Walter W. Becker	Oliver L. Erickson	Arthur P. Limperich	Claude E. Reinsch
Walter B. Bering	Elmer F. Hardlannert	Harry C. Mason	Paul E. Rice
Paul J. Boland	R. M. Hergenrother	Foster M. Matteson	Guy E. Romans
William J. Brennan	John J. Hess	Howard L. Miller	Alvin B. Rosenau
Carl H. Bryner	Ambrose I. Hughes	David L. Morrissey	Lessing R. Sattler
Byron J. Callan	Walter L. Hull	Humphrey F. Murphy	Ralph A. Stava
Fredolph C. Challquist	Harold K. Jones	Everette B. O'Keefe	Joseph H. Wachter
Louis J. Chaloupka	Emanuel A. Johnson	Joseph S. Parker	Louis C. Walsh
Frank T. Conway	William D. Kehoe	Alden E. Perry	Benjamin O. Weisel
James H. Curran	Glenn S. King	James Plihal	William N. Yuen
Michael E. Dougherty	Abe H. Kline	Herman F. Quade	Fred. L. Zehnppennig
Everett L. Dreyer			

University of Maryland, Dental Department.

At the annual commencement exercises of the Dental Department of the University of Maryland, held in Baltimore, Md., 1919, the degree of Doctor of Dental Surgery was conferred on the following graduates:

H. R. Alexander	R. N. Harper	E. M. LaBar	Benj. Muscat	L. S. Sheldon
L. H. Ames	Nelson Harris	A. H. Levenson	E. K. Myers	E. I. Shirk
F. L. Baber	Louis Hendin	Jos. Levin	E. G. Neary	David Smith
A. I. Bell	J. N. Hester	V. H. Long	L. D. Neish	G. H. Smith
J. R. Bernardini	A. J. H. Hirsch	E. G. McQuaid	F. Padilla	E. T. Stevens
M. G. Bernert	L. E. Hope	J. T. Manley	A. E. Parent	E. M. Taylor
S. H. Callejas	W. G. Horst	P. H. Mason	W. W. Patten	A. A. Tetu
A. Corretjer, Jr.	P. J. Houlihan	G. M. Masten	A. Pavloff	W. A. Trahan
C. A. Davis	H. L. Hurst	M. Matsutani	C. E. Peterson	R. B. Ugarte
N. Dubrowsky	Samuel Issow	L. W. Mehaffey	O. J. Plasse	R. L. Underwood
G. W. Elzey, Jr.	H. W. Jacobs	F. C. Mendenhall	F. E. Polanco	B. K. Vencius
R. C. Engleman	T. D. Kauffelt	A. C. Miller	A. R. Remsberg	F. C. Webster
F. H. Fast	D. W. Keaton	J. B. Milliken	W. C. Ridenhour	H. R. Williams
D. H. Fleming	H. W. Kennedy	D. H. Mitchell	E. J. Roberts	T. S. Wilson
D. E. Gaines	F. F. Killian	R. W. Mitchell	C. A. Ryan	D. F. Wolin
E. H. Garey	D. P. Krause	D. B. Mizell	W. J. Saunders	S. J. Wolohan
M. F. Haber	L. Kunzelmann	B. R. Morrison	H. O. Savard	A. Zelwis
A. A. Hall	J. A. Lee	A. C. Muhlbach	D. R. Schwartz	

Thomas W. Evans Museum and Dental Institute School of Dentistry University of Pennsylvania.

At the annual commencement exercises of the Thomas W. Evans Museum and Dental Institute School of Dentistry University of Pennsylvania, held Thursday, June 19, 1919, at the Metropolitan Opera House, Philadelphia, Pa., the degree of Doctor of Dental Surgery was conferred by Edgar F. Smith, Chem.D., Sc.D., L.H.D., provost, upon the following candidates:

Percy H. Ace	Pennsylvania	Lawrence R. Davis	Pennsylvania
Charles K. Adams	Pennsylvania	Rolly A. Davis	New Jersey
Raymond Adams	Pennsylvania	James B. C. Delehanty	Massachusetts
Carl C. Aldrich	Pennsylvania	Magnus J. Dineson	New Jersey
Stuart E. Alford	New York	Joseph C. Donnelly	Pennsylvania
Horace E. Alleman	Pennsylvania	John A. Donovan	New York
Herman Alofsin	Connecticut	Adelbert B. Dusinger	New York
Salvatore C. Andaloro	Pennsylvania	Edwin A. Edmunds	Pennsylvania
Lillian S. Anderson	New York	Richard M. Egan	Pennsylvania
Rollin H. Anderson	Pennsylvania	Henry S. Eighmey	New York
Walter J. Anderson	New Jersey	Ellsworth J. Elderkin	New York
Paul W. Angstadt	Pennsylvania	Milton C. L. Ellis	Pennsylvania
Earle S. Arnold	Connecticut	George A. Englert, Jr.	New York
Edward R. Aston	Pennsylvania	Leo Epstein	New Jersey
Adams Bailey	New York	John C. Evans	New Jersey
Herbert L. Baker	New York	Charles B. Farrell	New York
Morris Balistocky	Pennsylvania	Joseph J. Ferguson	Pennsylvania
George D. Ball	New York	Ferdearle J. Fischer	New York
Charles A. Barder	Pennsylvania	Harold Fischer	Pennsylvania
John E. Barker	New Jersey	Bernard J. Ford	Pennsylvania
John W. Barron	New Jersey	Merritt L. Fordham	Brazil, S. A.
John D. Beattie	New York	Paul J. Freedman	New York
Samuel W. Beck	New York	Ernest D. Friday	Pennsylvania
Harold W. Black	West Virginia	Robert Friedman	New Jersey
Philip T. Bobst	Pennsylvania	Jacob J. Friedman	New York
Charles A. Bogart	Pennsylvania	Leo J. Gallagher	New York
Edward T. Bohan	Pennsylvania	Samuel B. Gerstner	New York
Maurice C. Bond	New York	Frank H. Gette	Pennsylvania
Charles E. Bowe	New Jersey	Elton G. Gilbert	Maine
Harold D. Bowman	New York	Robert E. Gillie	New Jersey
Allan G. Brodie	New Jersey	Jacob Golann	New York
Charles W. Brown	Pennsylvania	Bainess A. Goldblatt	New York
Anna L. M. Bruenn	Pennsylvania	James E. Goldfield	Pennsylvania
Walter E. Buckley	Pennsylvania	Chester A. Good	Pennsylvania
Fountain Burlew	New Jersey	David J. Goodfriend	Pennsylvania
Benjamin M. Buyer, Jr.	Pennsylvania	Irving I. Goodman	New Jersey
John V. Cahill	New Jersey	Harold C. Grant	Maine
James M. Caldwell	Pennsylvania	George W. Gray	Massachusetts
Gerald W. Callahan	New York	Harlan B. Greeson	Nebraska
William J. Cant	Pennsylvania	Frederic LeR. Haffner	New York
James S. Cattanaach	New Jersey	Fred A. Hager	Pennsylvania
Charles A. Clapper	New York	Norman R. Haig	Pennsylvania
Albert F. Clark	Pennsylvania	Lloyd R. Haight	Washington
Arthur G. Clarke	Colorado	Hollis H. Hammond	New York
Francis J. Clary	New York	Aaron I. Handler	Pennsylvania
Herbert K. Cooper	Pennsylvania	Courtney S. Harris	New Jersey
John B. Cooper	Pennsylvania	Irving H. Harris	New Jersey
Angelo J. Corbo	Pennsylvania	Frederic A. Hatch	Maine
Augustine E. Croke	England	Walter C. Haymond	Utah
Edward A. Cronauer	Pennsylvania	Archibald B. Henderson	New York
James A. Crosier	New York	Howard C. Henderson	New Jersey
Earle M. Crysler	New York	Lemuel W. Higgins	Massachusetts
Willis N. Cummings	Texas	Leon M. Hilditch	Connecticut
Alejandro Daleceio	Porto Rico	Albert W. Hiller	New York
Robert P. Davey	New Jersey	Henry C. Hinchman, Jr.	New York
Isaac E. Davies	Pennsylvania	Harold E. Hinterleiter	Pennsylvania

D. Munger Hodgman	Illinois	John W. Parker, Jr.	Pennsylvania
Augustus B. Holt	New York	Charles H. Patton	Pennsylvania
Samuel Horwitz	Pennsylvania	John D. Peebles	Pennsylvania
William G. Houghton	New York	Joseph A. Perin, Jr.	New Jersey
Frederick W. Hummel	Connecticut	Bernard Perlman	Pennsylvania
Horace C. Hutchison	Pennsylvania	Ernest W. Peterson	New Jersey
Kenneth R. Iveney	Maine	George H. Proper	New York
Thomas H. Ivory	New York	Raymond E. Putney	Arizona
Mamie Jackson	England	Joseph M. Pyle	Pennsylvania
Samuel H. Jagust	New York	Charles W. Riggall, Jr.	Pennsylvania
William E. James	Pennsylvania	Joseph Rivkin	New York
William H. Jenkins	New York	Charles W. Roll	New Jersey
Edward J. Jennings	New Jersey	Samuel Ronkin	New York
Horace E. Jones	Indiana	Russell O. Salmon	New York
Newell T. Judge	Pennsylvania	Milton Salomon	New York
Richard R. Keator	New York	Clayton H. Samuels	Pennsylvania
Edgar Kehler	Pennsylvania	Gerson Scheps	New Jersey
Milton M. Kessler	Washington	Walter C. Schleede	New York
George L. Kilbourn	Vermont	Benjamin Schneyer	Pennsylvania
Joe W. Killen	New York	Raymond W. T. Scull	Pennsylvania
Russell V. Kilmer	New York	Charles G. Seibert	New Jersey
Edward C. King	Pennsylvania	Walter J. Shea	New York
Harry G. Kirrstetter	Pennsylvania	Antonio Silva	Porto Rico
Gerald T. Knight	Pennsylvania	Leo R. Silverman	Pennsylvania
Ewing M. D. Koenig	Pennsylvania	Hans J. P. Simonsen	Denmark
Dominic V. La Cava	Connecticut	Mark J. Skeffington, Jr.	Pennsylvania
George M. Lance	New Jersey	George A. Smith	Connecticut
Jacob Lange	South Africa	Victor H. Smith	Washington
Tai C. Lau	China	Earle Sneidman	Pennsylvania
Guy S. Lerch	Ohio	Samuel L. Snyder	Pennsylvania
Isadore M. Lieberman	Pennsylvania	Rubin Sprafkin	New York
Sibley Littig	Massachusetts	Andrew M. Stannard	New Jersey
Carl A. R. Lofgren	New York	Earl W. Stout	Pennsylvania
Robert P. Lowery	Pennsylvania	George Straussberg	New Jersey
Anthony Luisi	New Jersey	Samuel F. Sullivan	Pennsylvania
John F. McKernan	Pennsylvania	John Raymond Taylor	Pennsylvania
Stuart H. Maglaughlin	Pennsylvania	Reginald T. Taylor	New York
Jean B. Malick	Persia	Robert C. Taylor	Virginia
William A. Manning	New York	Ronald L. Thompson	New Jersey
Norman L. May	Pennsylvania	Louis E. Tomsuden	New York
Walter C. May	Pennsylvania	Hugh I. Towey	New Jersey
William W. May	New York	Max Traurig	New Jersey
James R. Mercer	West Virginia	Lester P. Trevaskis	Pennsylvania
Arthur G. Miethke	New York	Julian A. Turrentine	New York
Herman Mintz	New York	Dallas McH. Van Horn	New York
Joseph M. Mitchell	New York	Edwin G. Van Valey	West Virginia
Pern T. Mohn	Pennsylvania	Joseph A. Viverito	New York
Joseph A. Mooney	New York	Clifford J. Waas	New Jersey
James H. Morris	New York	Joseph L. Wachter	New York
Maurice Moskowitz	Pennsylvania	Milton A. Walker	New Jersey
Francis P. Motzenbecker	New Jersey	Charles L. Warshawsky	New Jersey
Laura M. Moyer	Pennsylvania	Robert G. Waterhouse	California
Theodore R. Murdock	New Jersey	Marcy Weinstein	New York
Charles S. Murphy	New York	Wilbert Westcott, Jr.	New Jersey
Marie S. Murray	New York	Herbert DeF. Whitmarsh	New York
Eugene W. Newman	New Jersey	Oscar Williams	Pennsylvania
Arthur Newmark	Pennsylvania	Ervin H. Wilson	New York
James Neylon	New York	John H. Wilson	Utah
Elisabeth Nordentoft	Denmark	William W. Winslow	Pennsylvania
Leo J. O'Boyle	Pennsylvania	Gordon R. Winter	New York
Thomas F. O'Boyle	Pennsylvania	Sidney D. Wolff	New York
Frederick H. O'Connor	New York	Edgar S. Yetter	Pennsylvania
Bernard T. O'Neil	New York	Henry S. Yost	Pennsylvania
Edmond M. O'Neil	New York	Tewfick Youakim	Egypt
James L. Padula	New Jersey	John F. Zabel, Jr.	New York
Walter Padwe	New Jersey		

Columbia University, Dental Department.

At the annual commencement exercises of the Dental Department of Columbia University, held in New York, N. Y., the degree of Doctor of Dental Surgery was conferred on the following graduates:

Irving S. Alderman	Connecticut	Ralph L. Harvey	New York
Eric L. Alling	New York	Edwin P. Hayden	Connecticut
Ralph Almour	New York	Selian Hebald	New York
Elmer L. Anderson	New York	Edson B. Heck	New Jersey
Morris Astrachan	New York	James H. Heyl, Jr.	Ohio
Philip S. Astrowe	New York	William F. Hill	New Jersey
Louis C. Baldwin	New York	Morris Hillman	Connecticut
Alvan L. Barach	New York	Alfred B. Hodges	Virginia
Edward Barsky	New York	James W. Howard	New York
Samuel M. Baum	New York	John T. Howell, Jr.	New York
Raymond H. Baxter	Massachusetts	Frank L. Hughes	Virginia
R. Donald Beck	New York	Don K. Hutchens	New York
Maurice Blaustein	New York	Arnold S. Jackson	Wisconsin
Edwin G. Bloor	New York	J. Lawrence Jones	Missouri
Karl A. Blum	New Jersey	Morris Kassel	New York
Raphael Breakstone	New York	Thomas D. Kelly	New York
Milton A. Bridges	New York	George King	New York
Matthew S. Broun	New York	Sidney Klein	New York
Irving Busch	New York	Percy Klingenstein	New York
Vincent DeP. Butler	New Jersey	Charles S. Knapp	Connecticut
Meredith F. Campbell	Wisconsin	Nathaniel Labovitz	Connecticut
Frederick Carpenter	Connecticut	Thomas O. Lake	Wisconsin
George A. Cashman	New York	Shailer U. Lawton	Vermont
Fremont A. Chandler	Wisconsin	Horst E. H. Leede	New York
Isaac Chasan	New York	Julius Lemelson	New York
Edward W. Clarke	New Jersey	Richard A. Leonardo	New York
Aaron Cohen	New York	Henry Levin	New York
David B. Cohen	Connecticut	Kenneth M. Lewis	New Jersey
Samuel L. Cohen	New York	William T. M. Liccione	New York
Bradley L. Coley	Connecticut	Arthur C. Linden	New York
David S. Dann	Michigan	Henry W. Louria	New York
David D. Davis	New Jersey	Harold Lusskin	New York
George W. Dickie	New Jersey	Leslie L. McCoy	Wisconsin
Robert H. F. Dinegar	New York	Arthur B. McGraw	Michigan
Francis M. Donehue	New York	Edwin P. Maynard, Jr.	New York
Robert O. DuBois	New York	Herbert W. Meyer	New York
Max Eagle	New York	Samuel W. Mills	New York
David E. Ehrlich	New York	Henry Minsky	New York
Benjamin B. Eichner	New York	Ralph R. Moolten	New York
Kay England	New Mexico	Isidor Mufson	New York
Sydney C. Feinberg	New York	Henry A. Murray	New York
Walter G. Frey, Jr.	New York	Cortland Myers, Jr.	Massachusetts
Robert Fridenberg, Jr.	New York	Rudolph W. Nemser	New York
Martin A. Furman	New York	Girard F. Oberrender	New Jersey
John H. Garlock	New York	Henry J. Olson	Wisconsin
R. Charles M. Gilmore	New Jersey	Max Palinsky	New York
Thomas L. Gingold	Connecticut	Harry Francis Pohlmann	New York
David Ginzburg	New York	Irving Poneman	New York
Herman Gliboff	New York	John J. Post	New Jersey
Simon P. Goldberg	New York	Nicholas S. Ransohoff	New York
David Goldblatt	New York	George H. Roberts, Jr.	New York
Robert K. Goldenberg	Connecticut	Meyer S. Robinson	New York
Max Michael Goldstein	New York	Leo S. Sacharoff	New York
Harry Golenbe	New York	Newton T. Saxl	New York
Milton Goodfriend	New York	Roswell L. Schmitt	New York
David G. Gregor	New York	Herbert A. Schulte	New Jersey
Daniel R. Haggerty	Massachusetts	James A. Seaman	New Jersey
Vincent Wyman Haight	New York	Morton Seldowitz	New York
Harry H. Hamilton	New York	Eliot A. Shaw	Massachusetts
Elake Harrison	New York	John Sherburne	New York

Edmund L. Shlevin New York
 Benjamin Siegel New York
 Harry Silver Connecticut
 Philip E. Stamatiades New York
 Maximilian M. Sterman New York
 Robert C. Stickney Massachusetts
 Robert F. E. Stier New Jersey
 Arthur Suer New York
 Walker E. Swift New York

Ralph T. B. Todd New York
 Arthur A. Tower Massachusetts
 George H. Von Emburgh New Jersey
 Henry V. Walsh New York
 James F. Walsh Connecticut
 Henry C. Wilkinson New York
 Frederick A. Wurzbach, Jr. New York
 Rodney E. Wyman New York
 Robert S. Young North Carolina

Chicago College of Dental Surgery.

THE thirty-seventh annual commencement exercises of the Chicago College of Dental Surgery were held in the Garrick Theatre, Chicago, Ill., on Tuesday, June 3, 1919.

Addresses were delivered by the Rt. Rev. Samuel Fellows, D.D., LL.D., and John L. Kendall, B.S., Ph.G., M.D.

The degree of Doctor of Dental Surgery was conferred by Truman W. Brophy, M.D., D.D.S., Sc.D., LL.D., on the following graduates:

G. Ambuehl	J. S. Flood	P. E. Jurissen	J. D. Meinhardi	C. F. Schwab
P. C. Arnold	C. A. Fodness	A. D. Kamin	E. E. Mertes	J. Selinger
J. G. Aryeff	B. F. French	J. C. Kamin	E. G. Miller	A. V. Sherman
W. R. Atcherson	L. V. French	C. P. Kan	J. Miller	J. S. Shoorer
J. Balk	A. Friedman	L. E. Kaufman	S. M. Mioduszewski	J. S. Silbertrust
E. A. Bannister	C. Friend	R. R. Keplinger	W. E. Moyer	B. L. Simonek
A. W. Baumgartner	J. F. Gaynor	A. W. Kettelhut	K. W. Murphy	E. G. Simonsen
M. H. Behnke	L. Gerlach	J. J. Kirby	A. W. Muyderman	C. J. Skowron
E. Belanger	F. H. Gibbens	E. G. Kirgis	N. P. Nicholas	F. L. Sladek
R. W. Benson	G. G. Glasgow	M. Kirschbaum	K. E. Nicholls	J. A. Smith
L. I. Berenson	A. E. Glawe	S. Korol	F. J. Nienstedt	S. Z. Sostrin
P. C. Bern	C. J. Goebel	A. J. Kraemer	Y. Noji	R. W. Souter
R. F. Berner	J. Goldberg	J. H. Kraemer	B. E. Norquist	J. A. Starzyk
B. Z. Black	K. Goto	S. Krongrade	B. M. Novak	A. D. Steele
C. B. Blake	E. E. Graham	K. Kuratate	C. L. Oesterle	H. A. Steinberg
E. P. Boulger	S. B. Green	C. E. Kurth	M. Oliff	D. D. Stewart
W. J. Bourcier	L. J. Greenwald	S. H. Kuznetsky	C. E. Olsen	M. O. Stoddard
E. H. Brastedt	L. Grigsby	I. E. Laby	C. G. Olson	I. E. Stone
A. I. Broder	G. B. Grinde	M. M. Lappe	C. Osterlund	T. D. Strohl
C. A. Brown	H. C. Hahn	E. G. Larkin	J. E. Opper	C. S. Suddarth
F. M. Bulger	F. R. Hamilton	J. Laskov	W. T. Osowski	H. C. Sunkel
W. Burton	C. C. Hart	F. G. Lauter	P. Ovitsky	W. C. Sutchter
L. J. Cahill	C. N. Heinzmann	F. A. Lauzer	S. J. Pacer	Y. Tanaka
G. W. Cappell	A. Henkin	L. N. Lee	A. M. Padt	T. D. Taylor
H. C. Carynski	G. A. Herkel	B. H. Legator	H. H. Pesch	C. Thompson
A. L. Chabut	J. Herman	S. A. Lemke	J. J. T. Poederbach	W. J. B. Thompson
Ambides Charal	W. H. Hirsch	R. C. Letson	J. J. Pomazal	P. W. Treick
C. G. Cherry	W. J. Hoefft	H. H. Levi	L. B. Purdon	D. D. Votsos
I. J. Chastka	H. C. Hoffeins	I. Levin	L. L. Quant	W. B. Walker
A. N. Cigrand	J. Hoffman	L. M. Levin	N. S. Rabin	Y. Watanabe
G. Cipalo	V. E. Hogstrom	R. S. Levin	A. J. Rifkind	I. A. Weaver
R. S. Clarke	S. C. Hopkins	W. Levin	C. A. Riley	C. L. Weber
R. W. Conner	C. L. Hopper	A. F. Lilley	R. C. Robinson	S. Weintfield
F. M. Cooney	K. Hori	J. V. Linder	A. M. Rosenblum	C. Weingart
S. D. Dalrymple	A. I. Horwitz	E. Lindmeier	H. W. Rupert	A. J. Welty
C. H. Davies	M. J. Hrusa	H. J. Lommel	E. H. Robleto	E. H. Westedt
E. J. Davis	F. L. Imlay	G. J. London	D. Sacks	H. M. Widen
R. A. Dawes	S. Ishibashi	E. Lorenz	A. Sagalove	P. C. Wittenberg
R. J. DeAno	H. A. Jacobs	D. E. McCarthy	S. M. Samson	W. Wittert
L. W. Dewhirst	E. James	T. R. McConnell	F. Satten	H. L. Worlton
C. K. Dittmer	M. M. Janov	H. E. McElroy	A. M. Saxon	W. L. Wright
L. E. Dolan	C. S. Johnson	L. G. Mack	J. Schaffner	H. E. Wyman
J. C. Early	F. R. Jones	J. M. Mariner	A. O. Schjeldahl	P. P. Zallys
C. M. Enoch	A. M. Jozefczyk	N. W. Marshall	A. A. Schmid	M. E. Zinser
S. I. Finch	C. Jung	H. D. Mason	D. Schnitzer	E. J. Zirbel
S. Fishbov	A. Juozaitis	H. Matsuda	J. H. Schust	C. H. Zui

New York College of Dentistry.

THE fifty-third annual commencement exercises of the New York College of Dentistry were held in Carnegie Hall, New York, N. Y., on June 18, 1919.

An address to the graduates was delivered by Rev. Harry E. Fosdick, D.D.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Max Abelow	Barney Goldstein	Abraham Linenberg	Harry Schneider
William Abelowitz	Samuel Goodman	Morris Linn	Max Schonbar
Mannuel L. Adler	Albert Gottesman	Isadore Liss	Abraham Schwartz
Francis V. Aguilera	Leon Gottlieb	Wilfred B. Lowenthal	Harry A. Schwartz
Howard T. Applegate	Mitchell Greenberg	Meyer H. Lurie	Jacob Schwartz
Jesse Arkin	Paul Grenberg	George A. Mack, Jr.	Samuel Schwartz
Harry Aronowitz	Abraham Greenfield	Samuel H. Mahler	Jerome D. Schwartz
Thomas A. Barry	Samuel M. Greengold	Hugo V. Matzner	Harry M. Seides
Samuel Berger	Rocco N. Guerra	Louis May	Benjamin Seifman
Benjamin Berlinski	Irving Gurland	Wm. J. McGowan, Jr.	Jonas Selverstone
John Bernikow	David Guterman	Francis X. McHugh	Morris David Senft
Emanuel Bialo	Julius Halpern	Harold G. McLaughlin	Samuel Shank
Samuel Bloomfield	Irving Harris	Isadore Medwin	Elias Shapiro
Joseph Bookbinder	Jacob Harrison	Louis Meylach	Morris Siegel
William R. Boos	Sylvester Hayman	Benjamin Meyrowitz	Charles Simonson
Joseph R. Burke	Isaac Hellman	Isidor Milberg	Sidney Slavin
Michael Burnstone	Rubeen Helpgod	Charles S. Mills, Jr.	David Slutsky
Robert H. Burr	Wm. F. Hendrickson	Solomon Mink	David F. Smith, Jr.
From Camenir	Seymour Hirschhorn	Harry Morgenstern	Samuel D. Soloway
Aaron Carmel	Jacob Hollander	Charles Moskowitz	David T. Sommer
David P. Cash	Victor Holtzman	Frederick W. Muth	Herman Sonnenblick
James Chaitovitz	Irving Hordes	Mortimer W. Needle	Irving Sperber
Philip Chenitz	Abraham H. Horowitz	Louis Neuwirth	Harry Spitz
Clarence H. Coen	Abraham M. Hutchinson	Walter J. O'Brien	George Stamler
Samuel H. Cohan	William H. Hyde	Myron Osrowitz	Harold A. Stanbrough
David S. Cohen	Benjamin Insel	Eric Ostberg	Isaac Stark
William Cohen	Samuel A. Isaacson	Albert H. Owens	Philip Steinberg
Wm. J. Cunningham, Jr.	George P. Jackson	Myron M. Parmet	Morton Sternberg
Louis Danetz	Morris E. Jeming	Frank A. Pelzer	Irving Stier
Henry B. Delaney, Jr.	Oscar E. Johnson	Aaron Pepper	Samuel Stiglitz
Peter P. De Leo	Nathan G. Kantrowitz	Edwin W. Piekhardt	Jacob Stiller
Leon Delson	Harry Kaplan	Abraham Pletman	Max A. Stone
Israel Denner	Isaiah Keller	John Queern, Jr.	Israel Sugerman
Frank T. Donahue	Barnett Kessler	Nathan M. Rachles	Leo Tanzer
John Drespel	John G. Kirsch	Sol. Louis Raphael	Henry N. Tear
Louis Duhal	Sidney D. Klaus	Abraham Rappaport	Alexander Tobias
David S. Ehrlich	Isidore Klein	Samuel Reichard	Charles C. Tokarski
Samson A. Feitelberg	William Klein	Elias Reiner	Leo Tolk
Joseph Fleisig	Albert Knapp	Isidore A. Richter	Irving A. Tow
George Feldman	Nathan Kniasewker	Bernard Rohr	Morris Tunick
Louis Finkelstein	Morris Krantz	Leslie J. Ronan	Morris Turkel
George H. Forman	Samuel Krauss	Abraham Rosen	Harry Unger
Gustav P. Frahm, Jr.	Henry C. Krupp	Irving H. Rosen	William Wagner
Samuel Franzblau	Edward H. L. Kruse	Harold L. Rosenberg	Archibald G. Webster
Harry Frey	Jacob L. Kuhn	Jack Rosenfeld	Nathaniel Weg
Edward Friedman	Irving I. Kulik	Bertram Rosenhain	Charles Weiman
Joseph Friedman	Bernard Kunin	Max Rosenthal	George J. Weinstein
Louis Friedman	Julius Kupersmith	Louis Rosin	Nathan Weinstein
Philip Friedman	Israel M. Lachs	Max Rowe	David Weisbrod
Ignac J. Friedmann	Benjamin Latinsky	Jacob Rublin	Gerson Winter
Ernest C. Gehle	Benjamin Lazarus	George Safechick	Samuel Wolff
Charles H. Gilman	Isaac Leshin	Philip Sarna	Jacob L. Wolfshaut
Dennis D. Glucksman	Max Levine	Angelo Scaravaglione	Joseph E. Wylan
Philip Goldberg	Meyer J. Levy	Benjamin Schauer	Max Zohman
Irving Goldman	Nathan M. Libowsky	Morris B. Scherzer	Louis Zucker
Jacob Goldman	Louis H. Liebman	Mervin L. Schloss	Henry Zwerin
Abraham S. Goldstein	Joseph J. Liebross		

University of Tennessee, College of Dentistry.

THE sixty-eighth annual commencement exercises of the College of Dentistry of the University of Tennessee were held in Memphis, Tenn., on Wednesday evening, June 4, 1919.

An address was delivered by Mr. C. P. J. Mooney.

The degree of Doctor of Dental Surgery was delivered by Acting-President Hoskins on the following graduates:

Hal A. Baker	Tennessee	Oras K. Matthews	Tennessee
William H. Black	Arkansas	Martin M. Rieder	New York
William A. Busby	Tennessee	Henry Rosenberg	New York
Webster Cleveland	Mississippi	Wallace C. Ryan	Alabama
Sidney T. Crabtree	Tennessee	Russ C. Snow	Mississippi
Willard J. Harrell	Tennessee	William Steinberg	New York
Claud P. Harris	Arkansas	Joseph E. Stephens	Arkansas
William R. Hunt	Arkansas	Robert S. Vinsant	Tennessee
David Jaller	New York	Asbury A. Weber	Tennessee
John A. Lewis	Arkansas	William H. Wilson	Alabama

University of Louisville, College of Dentistry.

At the annual commencement exercises of the College of Dentistry of the University of Louisville, held in Louisville, Ky., the degree of Doctor of Dental Surgery was conferred on the following graduates:

Maurice C. Arnold	Indiana	S. F. Hutchings	Kentucky
H. H. Barker	Maine	L. O. Johnson	Kentucky
Guy H. Beasecker	Ohio	Paul Jones	New York
Wirt R. Belcher	West Virginia	M. F. Lamkin	Kansas
L. L. Bourquin	Ohio	H. J. Lile	Arkansas
H. H. Brixey	Tennessee	R. R. Linville	Kentucky
L. J. Brown	Pennsylvania	W. D. Lucas	Kentucky
E. T. Butler	Illinois	M. L. Lumpkins	Tennessee
L. E. Chapman	Missouri	W. C. Lyons	Kentucky
J. F. Claffey	New York	R. R. McCready	New York
W. G. Clark	Kentucky	H. J. McGucken	West Virginia
Edw. J. Connelly	Kentucky	Clyde E. Minges	North Carolina
Morrey Cooper	Ohio	George D. Mitchell	West Virginia
Edw. J. Coyle	Michigan	Charles K. Morrison	Michigan
K. R. Davis	Indiana	John S. Otten	Wisconsin
J. Roe Driscoll	Indiana	Harley G. Park	Ohio
M. H. Elliott	Kentucky	M. J. Potter	Kentucky
I. W. Farnsley	Indiana	James W. Reily	Indiana
Chas. N. Fiero	Pennsylvania	William L. Schell	Kentucky
Wm. M. Fischer	Indiana	Edw. J. Schrieber	Connecticut
W. Steele Flack	Indiana	Joseph S. Seal	Nebraska
B. K. Flanery	Missouri	Frank F. Shelton	Alabama
C. D. Garland	Texas	William M. Smart	Montana
H. E. Gill	Indiana	Roy A. Sparks	Nebraska
S. A. Gillette	Indiana	Lars R. Sullivan	Oklahoma
G. A. Goode	Pennsylvania	Ella R. Tichenor	Kentucky
W. C. Green	Kentucky	Walter Vogt	New York
J. F. Hall	Kentucky	Stephen J. Velna	Illinois
L. R. Hamilton	Kentucky	Rupert G. Voreck	Iowa
P. J. Held	Indiana	William J. Weber	Indiana
R. A. Henson	West Virginia	Edw. Welch	Massachusetts
H. Herkenrath	Washington	F. W. Welch	Massachusetts
H. C. Hill	West Virginia	Henry E. Wilhelmus	Indiana
F. J. Hower	Kentucky	Lyda W. Woody	North Carolina
R. L. Hughes	Kentucky	Burch Wulie	Kentucky
W. G. Hughes	California	Earl V. Yocum	Kentucky

University of Illinois, College of Dentistry.

At the annual commencement exercises of the College of Dentistry of the University of Illinois, the degree of Doctor of Dental Surgery was conferred on the following graduates:

Odell T. Arneson	Thomas L. Doyle	Samuel M. Lapp	Joseph E. Plevé
William A. Bacher	Maurice Forwalter	A. Lehman	Leon R. Ploche
Martin E. Bellows	Chester J. Geduldig	Maurice A. Lippitz	Russell T. Pretlow
Arthur E. Blatt	Elsie M. Gorman	Clifford C. Loomis	Marjorie M. Reiland
Max W. Bloom	Albert E. Halbmaier	Donald N. McGugin	Clarence J. Robbins
Bernard T. Bluestein	Paul G. Halmhuber	Lee K. McKeague	Harry L. Ruben
Jacob A. Brodsky	Slavie O. Hamachek	Felix McD. V. Maillard	Jaroslav Rund
Stanley O. Brooks	Louis Handler	Krikar Margosian	Kenneth P. Shalek
Earl F. Bush	Panagiotis A. Harris	Raoul J. Marchand	Barney H. Simon
George A. Campbell	Leon F. A. Hein	Genslin R. Marsily	Eugene A. Spafford
Laura K. Chambers	Martin S. Henderson	William G. Metcalf	Leslie O. Spillane
Owen R. Chase	Richard J. Huseby	William V. Middleton	Robert C. Stiernberg
Francis L. Condren	Joseph J. Kane	Jose F. Nava	Emil Miroslav Vita
Harry W. Cook	Abe J. Kastel	Mary Newell	Erskine W. Webb
Septimio R. Di Cosola	John L. Lacey	John F. O'Connor	Hubert Weidner
Frederick C. Dippel	Clarence A. Landgren	Robert K. Ort	Harold T. West

Baltimore College of Dental Surgery.

At the annual commencement exercises of Baltimore College of Dental Surgery, held in Baltimore, Md., the degree of Doctor of Dental Surgery was conferred on the following graduates:

G. M. Anderson	Maryland	W. E. Kinney	Massachusetts
A. A. Arsenault	Maine	L. M. B. Koontz	Maryland
F. A. Batzle	New Jersey	R. W. Lamb	Massachusetts
P. Bernabe	Porto Rico	L. J. Letourneau	Massachusetts
R. W. Black	Massachusetts	J. H. Leydig	Maryland
J. Breth	Pennsylvania	W. S. Long	North Carolina
J. E. Burns	Massachusetts	L. T. McCrohan	Massachusetts
V. R. E. Carey	New York	E. F. Magers	West Virginia
J. R. Charles	New York	G. Martorell	Porto Rico
F. E. Chauvin	New York	N. E. Maxwell	West Virginia
H. M. Clement	Maine	T. P. Mellor	Pennsylvania
E. F. Cotter	Connecticut	N. H. Merrihew	New York
C. L. Curtin	Massachusetts	H. W. Miller	Connecticut
M. W. Davis	West Virginia	W. A. Mills	Rhode Island
W. D. Day	New York	J. Monash	New York
G. P. R. Dennis	Maryland	C. L. Noboa	South America
R. F. Dorset	Virginia	D. W. Page	New York
T. G. Dunn	New York	N. E. Page	Pennsylvania
S. A. Eppley	Pennsylvania	J. M. Quintana	Spain
C. A. Evans	Ohio	C. C. Sharp	New York
J. F. Fehler	Maryland	R. H. Sharp	Canada
H. Fine	New Jersey	C. C. Smith	West Virginia
E. M. Foley	West Virginia	R. C. Speiser	Connecticut
J. C. Fowler	Maryland	A. L. Spiegelglass	New Jersey
J. L. Godburn	Connecticut	H. L. Staples	Connecticut
E. Gregory	Massachusetts	F. H. Stegman	New York
G. Hanna	Pennsylvania	O. H. Stinson	Pennsylvania
G. W. Happenny	Connecticut	C. W. Turner	South Carolina
P. H. Hernandez	Porto Rico	G. Um pierre	Porto Rico
C. S. Heyliger	Porto Rico	E. Waxberg	Sweden
H. T. Hicks	Maryland	G. B. Wells	South Carolina
C. J. V. Hudson	Kentucky	J. L. Winton	West Virginia
J. S. Igartua	Porto Rico	H. E. Young	West Virginia
H. E. Kerwin	Massachusetts		

George Washington University, Dental School.

THE annual commencement exercises of the Dental School of George Washington University were held in Washington, D. C., on June 18, 1919.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Dewitt T. Baker	Texas	James F. Mitchell	Rhode Island
Walter C. Cheely	Colorado	Ralph L. Morrison	Maryland
Edward H. Donovan	Massachusetts	Shigeru Ozawa	Japan
John W. Dull	Pennsylvania	Ivan H. S. Richman	Minnesota
Bernhard E. Erikson	Illinois	George J. Saferstein	New Jersey
William H. Gorton	New York	Charles V. Stiefel	District of Columbia
Louis J. Genesse	New York	Charles L. Thomas	Texas
Elliott A. Hunt	New Jersey	Jacques Veintraub	New Jersey
Jack S. Kaplan	New Jersey	Carl R. Wheelock	Ohio
Samuel Katzman	New York	Earl B. White	District of Columbia
Clarence E. Kelly	Missouri	Charles R. Witt	Indiana
Robert W. McCullough	Maryland		

Northwestern University Dental School.

At the annual commencement exercises of the Northwestern University Dental School, held on June 18, 1919, in Chicago, Ill., the degree of Doctor of Dental Surgery was conferred on the following graduates:

Charles H. Adams	Louis J. Fein	Thomas B. Knopp	Farrow R. Powell
Hamilton L. Akin	Lloyd E. Fisher	Frederick L. Kroner	Herbert J. Quinn
Holt W. Alden	Wayne K. Frakes	Theodore B. Kurtz	Frank J. Rees
Willie V. Ammons	Winn O. Francisco	Earl W. Lambert	Samuel J. Rosenstein
Orvel A. Anderson	Erwin A. Gilbert	Lloyd M. La Pres	Knut I. Rosheim
Wade B. Anshutz	Raymond H. Gindick	Otto H. Larsen	Emmett J. Ryan
Albert Applebaum	John E. Gleave	Chester A. Larson	Frederick C. Scherman
Yeghia B. Baghdikian	Ray. F. Goering	Russell V. Leach	Otto W. Silberhorn
Goodmon Bakowen	William A. Gordon	Arthur L. Lee	Charles L. Simons
Walter C. Ball	Benjamin G. Graber	Hjalmer Lindberg	Sidney L. Slagerman
Leo P. Bantle	Alexander Greenberg	John R. Lipecki	Ira W. Slingsby
Walter L. Payne	Vern R. Greenwood	Maclaren E. Love	Stanley J. Smith
Nelson Beal	John W. Hanson	Milo R. Lunak	Hugh C. Snyder
Walter R. Beck	Abraham H. Harris	Paul A. Lyga	Frank W. Southworth
Gorden G. Berg	Stanley A. Harris	Frank W. McKnight	Arthur F. Starksen
Henry W. Berry	Harry C. Henningson	Austin J. Mackey	Nathan A. Styr
Everard A. Bishop	Gabriel J. Heyboer	Morris A. Manevich	Forest L. Swaisgood
Carl H. Boyden	Dale H. Hoge	Philip Mann	Roscoe E. Swartz
Charles R. Boyland	Lilly C. Hoiberg	Jules R. Matthew	Arthur Tanner
Samuel Bromberg	Edwin E. Holmes	Noel M. Maxson	Joseph Yau Ting
Patrick M. Butler	Frank W. Howell	Arthur C. Meigs	Percy B. Underwood
Milo H. Cabeen	Earl W. Huscher	Henry D. Meyer	Harry L. Vanoucek
Winford H. Caradine	Lester A. Hyland	Jacob Milstein	John G. Voigt
Walter C. Chapin	Willard W. Irle	Charles W. Motz, Jr.	Harry E. Waalkes
David N. Chlavin	Ralph T. Jackson	Hays N. Nance	Chester K. Walker
Nina K. Christopher	Frank C. Jacobs	Louis Neyman	William F. Watson
Dayton S. Cochran	Alexander W. C. Jeffery	Cornelius V. Nichols	Roland A. Weber
Marion L. Corbett	Ernell Jensen	Arthur J. Norman	James B. Webster
Harold C. Curley	Alvin L. Johnson	Egnar W. Nystrom	Arthur J. Wells
Walter W. Dalitsch	James M. Jorgensen	Edward N. Oberdorfer	Solly L. Winnick
M. Chan-Don Dietrich	Edward Kahn	Thomas W. O'Connor	Michael J. Wollmann
Ray McK. Dix	Casimir J. Kasputis	John N. O'Keefe	William L. Wylie
John H. Eberhart	Charles H. Kendall	Charles W. Penberthy	Philip E. Zeiss
Nels M. Elliott	Casimir K. Kliauga	Raynold E. Peterson	Albert M. Zimmermann
Joseph L. Farrell			

Philadelphia Dental College (Temple University).

At the annual commencement exercises of Philadelphia Dental College (Temple University), held in Philadelphia, Pa., on June 26, 1919, the degree of Doctor of Dental Surgery was conferred on the following graduates:

Murray H. Ash	Mamie A. Gapinski	Louis A. Kraiman	Edmund O'C. Redhead
Louis L. Binder	Lewis D. Giles	Theophilus S. Langston	Jose R. Salamanca
William E. Black	Henry J. Grady	Paul D. Legien	Andres M. Salgado
Henry W. Bonsal	George H. Graue	Joel M. Levin	Arthur E. Shaw
Bernard M. Brickman	Daniel W. Gromley	Hunting J. Lord	Samuel Shevlin
Oliver R. P. Campbell	Michael A. Heiman	John B. Lovell	Adolph Stern
Hyman F. Chaiken	Louis Herman	Myrtle A. Myers	Cornelius E. Thomas
Frederic P. Chrisman	Lawrence E. Hess	Henry R. Maurer	Emil Vogel
L-A. M. Dartiguenave	Emery B. Howard	Evelyn Phillips-Nickey	Kimber E. Vought
John F. Ditunno	Alfred L. Kay	John D. Nickey	Gladys L. Warnock
Morris N. Feldstein	Ira F. Keiter	Jacob W. Nulton	Oliver W. Winters
Benjamin Fleisher	Nathan Koff	Michael H. Pelosi	

Harvard Dental School.

At the annual commencement exercises of Harvard Dental School, held in Boston, Mass., the degree of Doctor of Dental Medicine was conferred on the following graduates:

Lester W. Adams	Evangelos C. Despotes	Thomas J. Keegan	William P. Odom
Marion A. Allen	Henry J. Donigan	Harold A. Kent	George P. Phillips
Augustin G. Anastasis	Rex N. Douglas	Gerald H. Knight	Richard B. Pomeroy
Oswald F. Banks	Leon E. Dulac	Maurice I. Kraslofsky	Roy Y. Raymond
Francis C. Bates	Hubert J. Garry	Glenn W. Lawrence	Joseph Ruby
William S. Bates	Bradford C. Godfrey	Homer D. Lindgren	Rolla B. Sargent
Carl L. Betts	Hyman L. Greenberg	Blake Lombard	Hyman B. Steller
Willis J. Bickford, Jr.	David Grosser	Barrett Lumian	Nathaniel Stowers
Robert B. Blackler	Arthur W. Hicks	Russell B. Macfarlane	Norman W. Swett
Earle L. Bradway	Solomon M. Hirschfield	Van Horne McMeans	Leon der S. Tashjian
Stanton L. Burgess	John H. Honan	Robert J. McNaul	Spurgeon deW. Turner
Michael L. Cannon	Frank H. Ito	Raymond J. Malone	Russell D. Wass
Everett R. Carmody	Maxwell L. Jameson	Charles A. Mullineaux	Joseph D. Wholley
Stanley A. Claves	Henry Kassels	Earle W. Munson	Benjamin D. Wolman

University of California, College of Dentistry.

At the annual commencement exercises of the College of Dentistry of the University of California, held in San Francisco, Calif., the degree of Doctor of Dental Surgery was conferred on the following graduates:

Leland A. Barber	George H. Grover	Constantine Marsili	Cecil C. Steiner
Roy F. Barton	George W. Hahn	J. Vance Matteson	Millard J. Streeter
Charles E. Boyd	Frank L. Hart	Saichi Nakahara	Wm. Harold Strickland
Lester E. Breese	Lyman D. Heacock	Clarence W. Neff	Charles A. Sweet
Hazen G. Burnett	Albert F. Heimlich	Samuel R. Olswang	Glendon H. Terwilliger
Amy Carlen	George A. Helmer	Alvin W. Pruett	Kenneth F. Terwilliger
John L. Cunningham	Lester A. High	Eugene E. Rebstock	Carl P. Tompkins
Harold E. Devlin	Dequilla Q. Jackson	John L. Rickley	Charles H. Tweed
Ernest C. Fischer	Arthur L. Jacobson	Bernard S. Rosen	Byron E. Van Alstyne
Clinton A. Fowler	Vernon E. James	William J. Roush	Leo L. Vorwerk
Robert C. Frates	Ernest L. Johnson	Edna M. Scott	Frederick S. Warford
Adolph S. Frost	Anton Kroger	Violet E. Scott	Willard S. Westwood
Earl J. Gibson	Eugene A. LaBaree	Herbert L. Shannon	Warner F. Wildanger
Pearce Glasson	Mervyn C. Lasky	Cyril A. Shottenhamer	Francis W. Young
Winfred L. Golden	Jesse A. Lingenfelter	Ernest R. Smith	Charles J. Zappettini
Roy A. Green	Paul E. Maimone		

University of Michigan, College of Dental Surgery.

At the annual commencement exercises of the College of Dental Surgery of the University of Michigan, held in Ann Arbor, Mich., the degree of Doctor of Dental Surgery was conferred on the following graduates:

Charles F. Adam	Johannes M. Donges	Christian R. Mañan	Alvin C. Schrader
George K. Ansurian	Kenneth C. Espie	Barnett Malbin	Otto T. Schwartzbek
Don C. Arner	Clarence W. Forster	Fred M. Marsh	Richard A. Sell
Levon A. Arozian	Benjamin E. Franklin	Russel D. Merritt	James C. Shanks
Omer B. Aubin	Henry C. Funkey, Jr.	Marion H. Miers	Harvey D. Shaw
Harry E. Barrows	Charles F. Furber	Charles S. Miller	Gabriel G. Smit
Wilna J. Bartlett	Myron E. Garner	Lyman G. Mixer	Haydon A. Smith
Armin H. Boehnlein	Henry J. Goodwan	Ralph W. Moore	Leonard G. de Speldor
Edward B. Bowerman	Robert L. Hatcher	Clifford T. Nelson	Earl B. Swift
George W. Brands	John Hayward	Howard A. Nelson	Elizabeth S. Swift
John Brower	N. H. van Heerden	Frank T. Nisbet	Paul S. Theron
Robert K. Brown	Maurice D. Immerman	Bertha L. Olsen	Norman F. Thomssen
Wilbert G. Burrows	Albert D. Kathian	Charles W. Oster	Ignatz G. Uhrle
Frederick W. Burton	Ray S. Kellogg	Melvin E. Page	Louis R. Ulrich
Leo A. Cadarette	William C. Kendall	Robert D. Pelham	Pedro G. del Valle
Michael C. Cameron	William M. Kirkland	Carlton J. Powers	Roy A. Vanderlinde
Martin H. Cnossen	Marmaduke A. Laake	Maxwell T. Purchase	Elizabeth S. de Villiers
David Cohen	Wilfred J. Lassaline	Howard W. Raub	Schalk I. B. de Villiers
Russell E. Curtis	Harold G. Lewis	Harry J. Rennell	Wilhelmina Yeretsky
Dudley A. Daniels	George C. H. Lubke	Jacob Schaffer	

North Pacific College, School of Dentistry.

THE annual commencement exercises of North Pacific College were held on Monday, June 23, 1919, in Portland, Ore.

Addresses were delivered by Herbert C. Miller, M.D., D.D.S., Rt. Rev. Walter T. Sumner, D.D., and Calvin S. White, M.D., Major M.R.C.

The degree of Doctor of Dental Medicine was conferred by the president of the college on the following graduates:

Mark W. Abernethy	Paul E. Dutton	William A. Johnson	Joseph L. Ringo
Leonard R. Andrews	Louis Erickson	Fred D. Johnston	John H. Rossman
Thomas W. Armstrong	George B. Evans	Bert T. Jordan	Robert R. Ruffin
John O. Badgley	Fred E. Farrior	Matsusabro Kuki	Dengo Saito
Frank R. Baker	Herman A. Fechtner	John Kuratli, Jr.	Harry F. Schoonover
Roland F. G. Banks	Augustin C. L. Fieq	Arthur J. Lake	Lynn A. Scott
Russell H. Beck	Lyle F. Fiker	Charles A. Laws	Lucille Sickler
Raymond F. Bell	Hugh W. Flanery	Paul D. Lewis	Grant Skinner
William R. Bernard	Thomas W. Fletcher	Frederick W. Liddle	Varon F. Smith
Freda Bilyeu	Charles F. Folsom	Edmund P. Lienemann	Donald A. Spratley
Earl L. Bird	Marvin A. Gould	John L. McPherson	Edward W. Stevens
Reza Black	Forrest V. Greif	May I. Martin	Julius G. Sture
Conrad H. Bowman	William O. Gresham	August Miller	James C. Thompson
Jacob B. Bright	Andrew Grimsted	John V. Mon Pere	Thomas T. Thompson
Harry R. Brown	Harvey M. Hanavan	John R. Morris	William C. Thompson
Donald W. Byrd	Charles D. Hanbloom	Kanich Nakagawa	Arthur Tongeland
Charles C. Calavan	Oscar T. Harstad	Albin Nitteberg	Harold G. Trommald
Hobart T. Cave	Donnell D. Havens	William S. O'Hira	James D. Tye
David C. Cohen	Nils A. Hogberg	Gustof R. Olin	Earl W. Udick
Ray W. Condit	William P. Hooper	Adolph N. Pearson	Rudolph C. Veith
Carlyle E. Cook	Otto R. Hougén	Raymond R. Peat	William R. Vetter
Wilson G. Coplen	Ralph L. Huber	John H. Peters	Ralph R. Vinson
Benjamin F. Cosper	Frederic McK. Ingersoll	Milo W. Peterson	Charles H. Walrath
Thomas Costello	Emil J. Jeannot	William V. Phillips	Fred R. Whitaker
Henry C. Dake	Carl W. Johnson	Edmund L. Pottinger	James Wilkie, Jr.
Smith R. Dippel	Cyrus P. Johnson	Hubert R. Ridgway	Carl R. Wilson
Oscar S. Driskell			

St. Louis University, School of Dentistry.

At the annual commencement exercises of the School of Dentistry, St. Louis University, held in St. Louis, Mo., June 5, 1919, the degree of Doctor of Dental Surgery was conferred on the following graduates:

Leo B. Baltz	Arkansas	Frank D. Lockwood	Illinois
Rueben E. Baumann	Illinois	Hugh T. McDermott	Illinois
Herbert F. Baumstark	Missouri	Justin J. Maley	Iowa
Max A. Beisel	South Dakota	George R. Mallick	North Dakota
George H. Berning	Illinois	Ralph C. Max	Missouri
James F. Blakemore	Arkansas	Robert J. May	Missouri
Arthur H. Buxton	Illinois	Jesse W. Miller	Missouri
Joseph E. Catudal	Kansas	Wilfred H. Morton	Missouri
Arthur G. Clark	Missouri	Clarence R. Murphy	New York
John W. Cohlmeier	Illinois	John T. Murphy	Illinois
John N. Collins	Illinois	Clarence E. Norris	Illinois
John H. Crowe	Missouri	Lenna B. Owen	Kentucky
Martinello P. Dougherty	Kansas	Mark E. Palmer	Iowa
Joseph F. Dreiling	Kansas	Elvus J. Pecaut	Missouri
Dennis Duffy	New York	Edgar Porth	Missouri
Glenn F. Edmiston	Illinois	Edgar Francis Rehn	Missouri
Walter W. Emons	Illinois	Reuben R. Rhoades	Missouri
Lawrence R. Finnegan	Wisconsin	William E. Setzekorn	Illinois
Jeremiah T. Gorman	Illinois	William L. Shamel	Missouri
Emanuel E. Haller	Missouri	Edward C. Signaigo	Missouri
John W. Hardy	Illinois	William D. Starling	Missouri
Amos Ripply Harlin	Missouri	Charles N. Stilley	Illinois
Oscar T. Haunmuller	Missouri	Joseph A. Thole	Missouri
Hugh J. Hogancamp	Kentucky	John R. Titus	Illinois
Frank W. Jaeger	Missouri	Guy H. Traylor	Illinois
Lawrence L. Jaffe	Connecticut	James LeR. Vize	Kentucky
William A. Kennedy	Oklahoma	James E. Weedon	Missouri
Taihei Kuzuhara	Japan	Saul E. Weisstein	Missouri
Frank R. Leiper	Illinois	LeRoy Williams	Missouri
Louis N. LeBoeuf	Canada	Harry I. Wilson	Iowa

ARMY AND NAVY DENTAL NEWS

Nominations.

Week ending June 28th.

To be CAPTAINS: 1st Lieuts. Samuel J. Rohde to Adrian C. Ragan, inclusive.

Assignments.

Army Dental Corps.

Week ending June 21st.

Maj. Wm. O. Boss to Washington Barracks, D. C., for duty.

Maj. Frederick H. Saunders to Oteen, N. C., general hospital 19, for duty.

Maj. Walter P. Christiansen to Jefferson Barracks, Mo., for duty.

Maj. Robert R. Luce to Camp A. A. Humphreys, Va., for duty.

Week ending June 28th.

Col. George H. Cassaday to Presidio of San Francisco for duty.

Lieut.-col. George D. Graham to Jefferson Barracks, Mo., for duty.

Majs. Walter L. Reesman and Wm. D. White, Capts. Horace R. Finley and Dell S. Gray to France for duty.

The following appointed a board to meet in the office of the Surgeon-general, Washington, about June 23d, for purpose of making a study of dental supply table, with a view of making such recommendations for revision as may be indicated: Col. Alden Carpenter, Lieut.-col. John R. Ames, Majs. Richard B. Clark, Ben H. Sherrard, and Guy P. Bannister.

Week ending July 5th.

Col. Edwin P. Tignor to Charleston, S. C., for duty as department dental surgeon.

Col. Wm. H. Chambers to Governors Island, N. Y., for duty as department dental surgeon.

Maj. Daniel T. Bowers to Washington for duty in attending surgeon's office.

Maj. Wm. D. White and Capt. Dell S. Gray to Camp Meade, Md., for assignment to overseas replacement depot.

Capt. Irving P. Carr to Americus, Ga., Southern Field, for duty.

Capt. Leon M. Muedeking to Colonia, N. J., general hospital 3, for duty.

Week ending July 12th.

Maj. Adolphus E. Worsham to Camp Lee, Va., for duty.

Maj. Rex McK. McDowell to Camp Meade, Md., for duty.

Maj. Stevens W. Brown to Fort Des Moines, Iowa, general hospital 26, for duty.

Capt. Clayton A. Patterson to Indianapolis, Ind., aviation repair depot, for duty.

Capt. Kyle P. Alsobrook to Fort Snelling, Minn., general hospital 29, for duty.

Capt. Clinton R. Boone to Brooklyn, N. Y., army supply base, for duty.

Capt. Lynval E. Davidson to Hoboken, N. J., for duty under port surgeon.

Capt. Louis B. Bergerson report by wire to commanding general, central department, for duty.

Navy Dental Corps.*Week ending June 21st.*

Lieut. J. C. Lough, base 29 to headquarters, London.

Lieut. R. C. Green, Spalato to headquarters, London.

Lieut. (Jn.Gr.) T. P. Donahoe, detached from duty at naval training camp, Pelham Bay Park, N. Y.; to duty on receiving ship at New York.

Lieut. E. H. Zimmer, Knapp's, No. 1755, orders modified to read: Delay in London; await further orders.

Lieut. D. A. Doherty, detached from duty in the 1st naval district; to duty on Virginia.

Week ending June 28th.

Lieut. (Jn.Gr.) John E. Herlihy, U. S. S. Tonopah, to report to Admiral Bristol.

Lieut. Horace S. Hirsh, detached from duty at naval training station, Great Lakes, Ill.; to duty at naval hospital, Great Lakes, Ill.

Lieut. Earl H. Zimmer, headquarters, London; to Brest for assignment.

Lieut. (Jn.Gr.) Paul E. Schwartz, detached from duty at navy yard, Boston, Mass.; to duty on receiving ship at Boston, Mass.

Week ending July 5th.

Lieut. Eugene L. Walter, detached from U. S. S. America; to cruiser and transport forces.

Lieut. Earl H. Zimmer, Dental Corps, Base No. 7; to Venice.

Week ending July 12th.

Lieut. (Jn.Gr.) Clarence E. Garcia, detached from duty in 12th naval district; to duty at navy yard, Mare Island, Calif.

Lieut. (Jn.Gr.) H. F. Buchanan, detached from duty at naval hospital, San Diego, Calif.; to duty at navy yard, Mare Island, Calif.

Lieut. (Jn.Gr.) John A. Waters, detached from duty in the navy yard, Philadelphia; to duty aboard the New Jersey.

Lieut. Rufus A. Ferguson, detached from navy yard, Philadelphia; to navy yard, Norfolk.

Lieut. Canute Bassen, detached from navy yard, New York; to duty at the naval hospital, New York.

Lieut. Herbert J. Lehman, detached from U. S. S. *Æolus*; to U. S. S. *Vermont*.

SPECIAL NOTICE.

Vanderbilt School of Dentistry Discontinues.

VANDERBILT UNIVERSITY begs to announce to present, former, and prospective students the discontinuance, for the present, of its School of Dentistry. This step has been under consideration for some time. It seems best to take this action now for the following reasons:

(1) The last three-year class has just been graduated, and the first four-year class will not graduate for two years; therefore the number of students affected is the smallest possible.

(2) Several of our professors now wish to resign or change their work. This would necessitate reorganization, a thing not easily effected under all the circumstances.

(3) Again, the present is a critical time in the history of all dental colleges. Dental education is now entering on a new phase. It is following the path of medical education. It will become increasingly expensive as the years go by. No institution can conduct this work worthily without considerable endowment available for this particular object.

The endowment of Vanderbilt University has increased considerably in the recent past. Some of this increase was for the School of Medicine, some for the College of Arts and Science. These funds are not available for dental education.

The University is not willing to allow the quality of its work to decline. Vanderbilt dentists are now filling the highest places in their profession and it would not be endurable to send out graduates in the future with any training but the best. Better than that is the decision to discontinue the School of Dentistry until larger resources are provided for its work.

If in the future an endowment of half a million dollars can be secured for this work, the University will be glad to re-establish the department. The training of dentists is a public necessity. It must be provided by public taxation or by private benefactions. Perhaps the closing of the Vanderbilt School of Dentistry at the present time is the best way to call attention to a need that will become greater and more pressing as the years go by.

J. H. KIRKLAND, *Chancellor.*

NASHVILLE, TENN., June 25, 1919.

SOCIETY NOTES AND ANNOUNCEMENTS

NOTICES should reach the Office of the DENTAL COSMOS *not later* than the 11th or 12th of the month preceding that of publication.

Coming Dental Society Meetings.

With the National.

NATIONAL DENTAL ASSOCIATION. New Orleans. October 20th to 24th.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS. New Orleans. October 18th to 20th.

NATIONAL ASSOCIATION OF DENTAL FACULTIES. New Orleans. October 20th to 24th.

AMERICAN ACADEMY OF PERIODONTOLOGY. New Orleans. October 17th and 18th.

ASSOCIATION OF MILITARY DENTAL SURGEONS. New Orleans. October 20th to 24th.

CONFERENCE OF PUBLIC SCHOOL DENTISTS. New Orleans. October 20th to 24th.

DELTA SIGMA DELTA FRATERNITY. New Orleans. October 20th.

PSI OMEGA FRATERNITY, GRAND CHAPTER AND NATIONAL ALUMNI CHAPTER. New Orleans. October 20th to 24th.

Xi PSI PHI FRATERNITY. New Orleans. October 20th to 24th.

State Society Meetings.

AUGUST.

VIRGINIA STATE DENTAL ASSOCIATION. Richmond. August 25th to 30th.

SEPTEMBER.

NEW ENGLAND DENTAL SOCIETY. Boston. September 3d to 5th.

NORTHERN INDIANA DENTAL SOCIETY. Muncie. September 10th and 11th.

TENNESSEE STATE DENTAL ASSOCIATION. Nashville. September 4th to 6th.

OCTOBER.

NORTHERN ILLINOIS DENTAL SOCIETY. Rockford. October 8th and 9th.

SUSQUEHANNA DENTAL ASSOCIATION OF PENNSYLVANIA. Scranton. October 8th to 10th.

Virginia State Dental Association.

THE Virginia State Dental Association will hold its annual meeting at the Medical College of Virginia, Richmond, Va., August 25 to 30, 1919. In connection with the annual meeting a postgraduate course of instruction will be given in the subjects of crown and bridge work, under the direction of Dr. Forrest H. Orton, Minneapolis, Minn.; nerve-blocking anesthesia and oral surgery, under the direction of Dr. Theodor Blum, New York City; and dental roentgenology, under the direction of Dr. A. L. Gray, Richmond, Va.

Further information regarding the postgraduate course can be obtained by addressing

W. H. STREET, *Corres. Sec'y*,
301 E. Franklin st., Richmond, Va.

Northern Indiana Dental Society.

THE thirtieth annual meeting of the Northern Indiana Dental Society will be held at Muncie, Ind., on Wednesday and Thursday, September 10 and 11, 1919. A cordial invitation is extended to all dentists to be present.

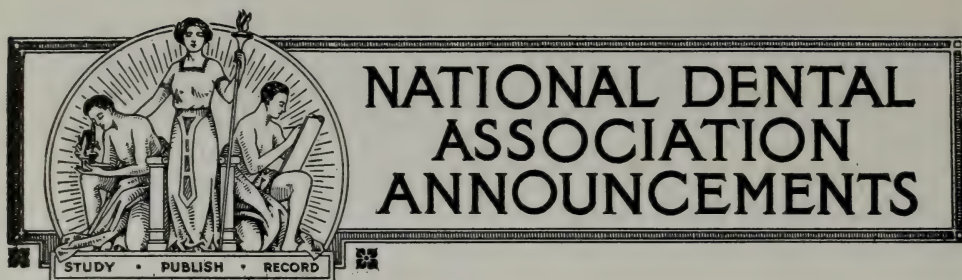
EARL BROOKS, *Acting Sec'y*,
Noblesville, Ind.

National Mouth Hygiene Association.

DEPARTMENT OF EXTENSION LECTURES.

A COMPLETE lecture set, consisting of full manuscript and thirty-six specially selected and prepared lantern slides covering the subject of Mouth Hygiene is furnished by this association to members of state dental societies and others who may be considered as qualified to present the subject on the lecture platform.

EDWIN N. KENT,
Director of Extension Lectures,
330 Dartmouth st., Boston, Mass.



Twenty-third Annual Meeting, held at New Orleans, October 20-24, 1919.

THE METROPOLIS OF THE SOUTH.

NEW ORLEANS always has been light-hearted and gay, and even in this cycle of industry, when all the world is scrambling to forge ahead, the Crescent City still has a moment in which to entertain the strangers within her gates. To the delegates attending the National Dental Convention, New Orleans renews her pledge to make their visit long to be remembered. During the time business slacks the visitors are assured a pleasurable time.

Never too hot, never too cold, is a good way to describe the climate of New Orleans. Surrounded on three sides by water, the city enjoys a mild, moist brand of weather. In October the temperature lurks between a light chill and an Indian summer warmth, and records show this month to have a high average in the sunshine column. July is normally the warmest month, and the average yearly mean temperature for forty-six years is 55.6°. Only seven days in forty-three years have seen the mercury rise over 100°, a record hard to touch.

This climate makes it possible to enjoy outdoor sports throughout the year. This is why New Orleans boasts a winter baseball league and games are played in December and January. New Orleans offers such sports as fishing; duck and snipe shooting in the marsh lands; tennis; golf; swimming; yachting; motor-boating; motoring the year round; horse-racing; a galaxy of theaters, and the famous French Opera during the winter months. Under such weather conditions, vis-

iting dentists may feel reasonably sure of conducting their golf tournament without interruption.

New Orleans is the greatest sea-food market in the world, and for this reason the sport of fishing is unsurpassed in the lakes and bayous surrounding the city. Every variety of game and food fish abounds, and a day of fishing in these waters will linger in the archives of memory.

The Metropolis of the South is primarily a city of fashionable clubs, fraternities, and homes. The clubs include the Boston, the Pickwick, the Chess, Checkers, and Whist Club, the Southern Yacht Club, Country Club, Round Table Club, Audubon Golf Club, and the Louisiana Club. All of these have homes which will be thrown open to the visitors. The Elks have the finest club-house in all Elksdom, and it will be open to the visitors. The shriners have just built a magnificent mosque, and the Masons have a building in keeping with their national standard. The Knights of Columbus also occupy a prominent place among the lodges.

And, of course, there is always the French Quarter, in which visitors may find the lights and shadows of yesterday—a truly wonderful place in which one might spend weeks without seeing everything. There is, however, quite enough within a stone's throw of Canal Street to excite the curiosity of the most *blasé*.

A trip along the river front will prove most enjoyable, and it is almost certain the Enter-

tainment Committee will arrange something of this nature, there being several sight-seeing steamers docked here at all times. New Orleans has the greatest inner harbor in the world, with forty-one miles of frontage at which eighty ocean-going ships may berth at once. This includes the Inner Harbor Navigation Canal, linking the river and Lake Pontchartrain with a lock-level channel 30 ft. deep, six miles long, and which connects all railroads and steamship lines. Port facilities, valued at \$13,551,206, include steel sheds and docks covering nearly eight miles, with 4,478,000 ft. of covered floor space.

New Orleans has just completed a \$15,000,000 army supply base warehouse of concrete construction—one of the greatest building projects in the history of the South. The warehouse covers 84 acres, and has three units of the same design each 140 x 600 ft., six stories high, with a two-story steel and pile wharf and warehouse 140 x 2000 ft. Eight ships can be loaded simultaneously at this wharf.

Other sights to be seen include the Chalmette battlefield; the American Sugar Refinery, the largest single unit plant in the world; the largest mahogany manufacturing factory in the world; the great municipal grain elevator, and ninety-four parks with a total area of 905 acres.

New Orleans has seven Class "A" Hotels, which include the St. Charles, Grunewald,

Monteleone, Lafayette, De Soto, Cosmopolitan, and the Planters. The following hotel rates will prevail:

Leading New Orleans Hotels and Their Rates.

S = Single, without bath. *Sb* = Single, with bath.
D = Double, " " *Db* = Double, " "

GRUNEWALD HOTEL (University Place, off Canal st.): *S* \$1.50, for two \$2.50 and up, *Sb* \$3.00, for two \$4.00 and up, *D* for one \$2.00, for two \$3.00 and up. (Rms. 500.)

ST. CHARLES HOTEL (St. Charles and Gammon sts.): *S* \$2.00 to \$3.50, *Sb* \$3.00 to \$7.00, *D* \$4.00 to \$6.00, *Db* \$5.00 to \$10.00; parlor, bedroom, and bath \$10.00 to \$25.00 per day. (Rms. 500.)

HOTEL MONTELEONE (Royal and Iberville sts.): *S* \$1.50 and up, *Sb* \$2.50 and up, *D* \$2.50 and up, *Db* \$3.50 and up. (Rms. 500.)

HOTEL DE SOTO (Baronne and Perdido sts.): *S* \$1.50 and up, *Sb* \$2.50 and up, *D* \$2.50 and up, *Db* \$3.50 and up. (Rms. 300.)

COSMOPOLITAN HOTEL (120 Bourbon st.): *S* \$1.00 and up, *Sb* \$2.00 and up, *D* \$2.00 and up, *Db* \$3.00 and up. (Rms. 100.)

LAFAYETTE HOTEL (St. Charles and Lafayette sts.): *S* \$1.50 and up, for two \$2.50 and up, *Sb* \$2.00 and up, for two \$3.00 and up, *Db* (twin beds) \$5.00 and up. (Rms. 80.)

PLANTERS HOTEL (Dauphine and Iberville sts.): *S* \$1.00 and up, *Sb* \$2.00 and up, *D* \$2.00 and up, *Db* \$3.50 and up. (Rms. 75.)

Preliminary Announcement of the Program of the Meeting

AT

New Orleans, La., October 20-24, 1919.

IN THE SECTIONS.

Orthodontia and Periodontia.

TUESDAY, 2 P.M.

"An Analysis of the Various Principles of Orthodontic Treatment that have been Advocated during the Last Fifteen Years." By J. A. Cameron Hoggan, Richmond, Va.

"Necessity for Oral Prophylaxis and Radiology in the Practice of Orthodontia." By F. M. Casto, Cleveland, Ohio.

"Observations upon the More Recent Developments in Periodontology." By Arthur H. Merritt, New York, N. Y.

"Why the Field of Prophylaxis is Marked with a Lack of Enthusiasm." By Dorothea A. Howes, Washington, D. C.

WEDNESDAY, 9 A.M.

"Plurality in Etiology of Periodontoclasia." By John O. McCall, Buffalo, N. Y.

"What to Extract, and What Not to Extract, with Reference to Infections Involving the Periodontal Membrane." By Louis D. Coriell, Baltimore, Md.

"An Analysis of Case Characteristics, with Reference to the Selection of the Most Effi-

cient Form of Appliance for Treatment." By A. H. Ketcham, Denver, Colo.

"The Problem of Retention." By C. A. Hawley, Washington, D. C.

Operative Dentistry, Materia Medica, and Therapeutics.

FIRST SESSION.

"The Prevention of Chronic Mouth Infection." (Illustrated with stereopticon slides.) By Arthur D. Black, Chicago, Ill. Discussed by H. E. Friesell, Pittsburgh, Pa.; A. H. Hipple, Omaha, Neb.

[This paper will consider briefly the pathological changes which occur in cases of chronic alveolar abscess and chronic pericementitis, and will then discuss the causes and take up in detail the methods to be employed in operative dentistry for their prevention. Extensive studies of radiographs of root-fillings will be reported, and means of simplifying pulp treatment and root-canal technique will be presented. Particular stress will be laid upon improvements in operative procedures to prevent periodontal infection.]

"X-ray in Dental Practice." By C. Edmund Kells, New Orleans, La. Discussed by H. B. Tileston, Louisville, Ky.; Howard R. Raper, Albuquerque, N. M.

SECOND SESSION.

"Some Recommendations for the Sterilization and Filling of Infected Roots." By Weston A. Price, Cleveland, O. Discussed by Clarence J. Grieves, Baltimore, Md.; Percy R. Howe, Boston, Mass.

"The Gold Inlay." By R. H. Volland, Iowa City, Iowa. Discussed by Wallace Wood, New Orleans, La.; W. L. Fickes, Pittsburgh, Pa.

Histology, Physiology, Pathology, Bacteriology, and Chemistry — Research.

FIRST SESSION.

"How Mouth Infection Affects the Kidneys." By Thomas B. Hartzell, Minneapolis, Minn.

"A Phase of Dental Caries." By Percy R. Howe, Boston, Mass.

"A Biochemical Study of Bacterial Metabolism in Its Relation to the Denser Tooth Structures." By Samuel E. Pond, Cleveland, Ohio.

SECOND SESSION.

"A Dental Histo-Pathological Study." By Harold Box, Toronto, Canada.

"Physiology and Pathology of Special Interest to Dentists." By J. J. Sarrazin, New Orleans, La.

"Studies of the Variations in Susceptibility to the (So-called) Rheumatic Group Lesions and to the Influence of Oral Focal Infections." By Weston A. Price, Cleveland, Ohio.

Prosthetic Dentistry and Crown and Bridge Work.

Special Announcement.

Owing to the fact that only two half-day sessions can be given to this section, it has been deemed best to dispense with long, exhaustive general papers and discussions, as more definite information can be given by selecting men to cover as many of the vital phases of this branch of dentistry as possible, with a view to standardizing technical procedure. The audience will thus individually have the opportunity of either accepting or rejecting the teachings of the essayists.

In addition to the papers and illustrations, the essayists will give individual clinics in order that those who desire to meet and discuss details further with the clinicians may have this opportunity.

FIRST SESSION.

PROSTHODONTIA.

"Scientific Interpretation of Muscular Control of Mandibular Movements." By Geo. H. Wilson, Cleveland, O.

[The dental profession and anatomists generally are not clear on this subject. Dr. Wilson has been doing research work along this line for some years, and is now ready to present his findings to the profession. Owing to the importance of this subject in its relation to denture construction we are fortunate to have it presented to us by a man of Dr. Wilson's ability and experience.]

"Surgical Interference for Preparation of Malformed Edentulous Mouths for Construction of Dentures." By James P. Ruyl, New York City.

[Demonstrates technique, using motion pictures for removing protruding gum tissue, irregular alveolar process, and other deformities, in order to simplify complicated cases by providing a firm foundation upon which to build artificial dentures that will be more efficient and more beautiful.]

CROWN AND BRIDGE TECHNIQUE.

"Construction of Cast Clasps for Partial Dentures and General Consideration of Other Methods of Retention and Attachment of Vital Teeth for Removable Bridge Work." By Louis J. Weinstein, New York City.

[Mr. Weinstein's knowledge of the uses and abuses of metals used in dentistry, combined with his technical experience, enables him to present us with definite information on a subject of vital importance at this time.]

"Porcelain Jacket Crown Technique." By A. L. Legro, Detroit, Mich.

[Demonstrates a definite technique for making this most esthetic as well as most valuable prosthetic restoration for the conservation of the dental pulp comparatively simple.]

SECOND SESSION.

PROSTHODONTIA.

"Selection of Artificial Teeth for Prosthetic Restorations." By P. C. Lowery, Detroit, Mich.

[Clearly demonstrates one of the most important phases of dentistry which a large majority of dentists do not seem to appreciate as much as they should. The doctor shows that it is much simpler to harmonize tooth and face form than it is to adapt the face of your patients to your ideal tooth form.]

"Correction of Malocclusion in Artificial Dentures." By M. M. House, Indianapolis, Ind.

[Demonstrates with precision the highest type of efficiency in artificial dentures.]

CROWN AND BRIDGE TECHNIQUE.

"The Gold Shoulder Crown Technique." By Wm. H. Elliott, Detroit, Mich.

[This technique of the most widely used restoration in dentistry is definite, accurate, and simple.]

"Attachments for Vital Teeth in Fixed Bridge Work." By Forrest H. Orton, St. Paul, Minn.

[Dr. Orton's reputation as a technician and teacher of teachable techniques is so great that no dentist can afford to miss an opportunity to hear him lecture.]

"Mandibular Movements and the Forms of Artificial Bicuspid and Molars Necessitated Thereby." By Prof. Alfred Gysi, Zurich, Switzerland.

"Mandibular Control." By J. Leon Williams, New York City.

Oral Surgery, Exodontia, and Anesthesia.

FIRST SESSION.

Symposium on Apicoectomy.

1. "Apicoectomy: Its Indications and Contra-indications, and Root-canal Technique." (Illustrated with stereopticon slides.) By Thomas B. Hartzell, Minneapolis, Minn.

2. "Surgical Technique of Apicoectomy." (Illustrated with stereopticon slides.) By Chalmers J. Lyons, Ann Arbor, Mich.

Discussed by Thomas P. Hinman, Atlanta, Ga.; William L. Shearer, Omaha, Nebr.; Carl D. Lucas, Indianapolis, Ind.; Clarence J. Grieves, Baltimore, Md.; H. A. Maves, Minneapolis, Minn.

"Nitrous Oxid-Oxygen Anesthesia in Oral Surgery and Dentistry." By J. A. Heidbrink, Minneapolis, Minn. Discussed by Wm. H. Deford, Des Moines, Iowa.; John W. Seybold, Denver, Colo.; Boyd S. Gardner, Rochester, Minn.

"Tic douloureux; Etiology, Diagnosis, Treatment—Palliative, Blocking, and Surgical." By Rudolph Matas, M.D., New Orleans, La. Discussed by Herbert A. Potts, Chicago, Ill.

SECOND SESSION.

"Impacted Lower Third Molar." (Illustrated.) By Geo. B. Winter, St. Louis, Mo. Discussed by J. P. Henahan, Cleveland, O.; Harry W. Allen, Kansas City, Mo.; O. T. Dean, Seattle, Wash.; Roy S. Hopkinson, Milwaukee, Wis.

Symposium on Block Anesthesia.

"Preparation of Solution." By E. A. Litchfield, Humboldt, Nebr.

"Pharmacology of Various Local Anesthetics." By Samuel L. Silverman, Atlanta, Ga.

"Indications and Contra-Indications." By Fred F. Molt, Chicago, Ill.

"Technique of Blocking." (The most important injections.) By ———

"Suggestive Therapy and Treatment of Abnormal Conditions During and Following Injections." By P. G. Puterbaugh, Chicago, Ill.

"Diseases of the Antrum." (Illustrated with stereopticon slides.) By Chas. H. Oakman, Detroit, Mich. Discussed by R. Boyd Bogle, Nashville, Tenn.; Truman W. Brophy, Chicago, Ill.

[AT NEW ORLEANS.]

American Academy of Periodontology.

THE sixth annual meeting of the American Academy of Periodontology will be held in New Orleans, October 17 and 18, 1919. Headquarters Hotel Grunewald.

An instructive program is being prepared for members as well as all dentists interested in the development of periodontia.

GRACE R. SPALDING, *Sec'y*,
803 Empire Building, Detroit, Mich.

[AT NEW ORLEANS.]

Association of Military Dental Surgeons.

THE Association of Military Dental Surgeons of the United States will hold its annual meeting at New Orleans, October 20 to 24, 1919.

The officers of the association are—Capt. Edwin P. Tignor, president; Capt. George H. Cassaday, vice-president; R. W. Waddell, D.D.S., secretary and treasurer, 347 Fifth ave., New York City.

[AT NEW ORLEANS.]

Delta Sigma Delta Fraternity.

THE thirty-fifth annual meeting of the Supreme Chapter of Delta Sigma Delta Fraternity will be held in the Elks' new lodge hall (which is about three blocks from the headquarters of the Fraternity), New Orleans, La., on Monday, October 20, 1919, at 9 A.M.

The regular order of business will be pursued, including action on the proposed amendments to the constitution and by-laws, to be followed by initiatory exercises in the afternoon.

Headquarters of the Fraternity will be in the Grunewald Hotel. The annual banquet will be held in the Elks' new lodge hall at 7 P.M. Those expecting to attend the banquet will greatly facilitate the work of the committee by making their presence known as early as possible on the day of the meeting.

By order of the Supreme Chapter.

CARL D. LUCAS, *Supreme Grand Master*,
R. HAMILL D. SWING, *Supreme Scribe*,
1623 Walnut st., Philadelphia, Pa.

[AT NEW ORLEANS.]

Conference of Public School Dentists.

A SPECIAL conference of dentists operating in school dental dispensaries and of persons interested in such is to be held in New Orleans at the time of the National Dental Association meeting, October 20 to 24, 1919.

At a similar meeting held June 13th at Syracuse, during the New York State Dental Society meeting, so much interest was shown that a committee was named, and instructed to call this national conference.

All persons interested are requested to extend their suggestions or questions to the committee.

WM. H. LEAK, *Chairman*.

Oral Hygiene Inspector,

N. Y. State Dep't Education.

S. R. MEAKER, Auburn, N. Y.

ERWIN SCHEID, Chazy, N. Y.

Dental Director, Chazy Central Rural School.

Tennessee State Dental Association.

THE fifty-second annual meeting of the Tennessee State Dental Association will be held at the Hotel Hermitage, Nashville, September 4, 5, and 6, 1919.

From all appearances our program promises the greatest meeting ever.

JAS. J. VAUGHN, *Ch. Publicity Com.*

Nashville, Tenn.

New England Dental Society.

THE New England Dental Society, formerly the Northeastern Dental Association, will hold its twenty-fifth annual meeting in Boston, Mass., on September 3, 4, and 5, 1919, at the Somerset Hotel, Boston, Mass.

ALVIN A. HUNT, *Sec'y*,

Hartford, Conn.

Northern Illinois Dental Society.

THE thirty-second annual meeting of the Northern Illinois Dental Society will be held at Rockford, Ill., on Wednesday and Thursday, October 8 and 9, 1919.

A cordial invitation is extended to ethical practitioners of dentistry.

R. P. CULVER, *Sec'y*,

DeKalb, Ill.

Susquehanna Dental Association of Pennsylvania.

THE fifty-fifth annual meeting of the Susquehanna Dental Association will be held at Hotel Casey, Scranton, Pa., October 8, 9, and 10, 1919.

As the members of the association all remember, this meeting was to have been held at the same time and place last fall, but on account of the influenza epidemic it had to be canceled, and it was arranged to be held in October so as not to interfere in any way with the attendance at the April meeting of the State Dental Society at Pittsburgh.

The executive committee are working out plans to make this the best meeting in the history of the association. It is going to be one of those good old-fashioned meetings that no one can afford to miss.

Further details will follow, but we give you this friendly little tip now—that it is going to be somewhat along the postgraduate line, some of the biggest men in the profession having already been retained for the three days.

Watch for further details and begin to plan to lock up your office for the whole session. We will make it well worth the trip.

J. P. COULT,
E. L. BROWN,
J. B. TWEEDELE,
Committee.

Dental Hygiene Council of Massachusetts.

ANNUAL MEETING.

THE members of the Dental Hygiene Council of Massachusetts (1907), representing the Massachusetts Dental Society, the American Academy of Dental Science, the Harvard Odontological Society, the Harvard Dental Alumni Association, the Tufts Dental Alumni Association, and the Forsyth Dental Infirmary for Children, met on the 26th of May for their annual meeting, and having attended to routine business passed the following resolution:

"The members of the Dental Hygiene Council of Massachusetts wish to express their appreciation of the services of Dr. EDWIN N. KENT, at the end of a seven years' term as

president of the Council, a service characterized by enterprise and important accomplishment in a variety of fields, notably in inaugurating a dental hygiene lecture for general use, preparing a list of standardized instruments and furnishings for dental clinics, and working with success for the continuance of a school lectureship in Boston schools; and we wish to express in particular our sense of his devotion to a large body of details in connection with his duties in the service of the Council.

"It is a source of gratification that Dr. Kent was selected as director of extension lectures of the National Mouth Hygiene Association, and that he is now serving as supervisor of Mouth Hygiene under the Massachusetts State department of Health."

The officers elected were as follows: William Rice, president; C. E. Parkhurst, vice-president; R. S. Catheron, secretary; R. B. Taft, treasurer; Executive Committee—C. R. Lindstrom, W. H. Potter, Horace L. Howe.

ROBERT S. CATHERON, *Sec'y*,
Boston, Mass.

New York State Examinations in Dentistry.

POSTPONEMENT BY THE BOARD OF REGENTS.

BECAUSE of the interference with the course of instruction, caused by the emergent inauguration of the Students Army Training-corps in connection with dental schools, it has been found that in many cases it is necessary to extend the course of instruction in the schools for the current senior year to a period beyond the regular date of graduation, many of the schools being obliged to lengthen the course to July 15th and some to a date as late as July 31st.

To the end that there may be no hardship to students thus graduating after the date of our regular June dental examination, it has been formally decided by the Board of Regents to postpone the June dental examination until the first Tuesday of September, and the September examination until the second Tuesday of November.

There was therefore no June dental examination held in this state in 1919, but this will not affect examinations in subsequent years.

AUGUSTUS S. DOWNING,
Assist. Commissioner of Education.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING MAY 1919.

May 6.

- No. 1,303,233, to ORMOND EDGAR WALL.
Process of making artificial dentures
and occluding form for the same.

May 13.

- No. 1,303,541, to WM. W. CURTIS. Grinding-
wheel for dental purposes.
No. 1,303,545, to JAMES H. DOWNIE. Im-
pression cake.
No. 1,303,588, to ARTHUR E. PECK. Tooth-
brush.

May 20.

- No. 1,303,881, to THOMAS F. GLENN. Arti-
ficial tooth.
No. 1,303,884, to CHARLES F. GOODNOW, Jr.
Sanitary toothbrush holder.
No. 1,304,038, to ADOLPH J. GLASER. Dental
plate.
No. 1,304,087, to DAVID T. PARKINSON. Appa-
ratus for manufacturing dental crowns.
No. 1,304,304, to NATHAN K. GARHART.
Bottle or jar for dispensing dental
liquids and the like.

- No. 1,304,396, to WM. C. SMITH. Former for
matrices for use in the restoration of
teeth.

May 27.

- No. 1,304,639, to MERRITT WILCOX. Tooth-
brush holder and sterilizer.
No. 1,304,720, to JACOB LOWE YOUNG. Den-
tal pliers.
No. 1,304,721, to JACOB LOWE YOUNG. Ortho-
dontia appliance.
No. 1,304,722, to JACOB LOWE YOUNG. Ortho-
dontia appliance.
No. 1,304,723, to JACOB LOWE YOUNG. Ortho-
dontia appliance.
No. 1,304,769, to ADOLPH H. HENDRICKSON.
Folding toothbrush.
No. 1,304,881, to JOSEPH E. JOHNSON. Tooth
band.
No. 53,366, to JEPHTHA G. HOLLINGSWORTH.
Design: individual dental-plate cleaner.
No. 125,563, to EDMUND DANTE CUTINO.
Trade-mark for toothbrushes, nail-
brushes, hair-brushes, hand-brushes, or
scrubs.

ISSUED DURING JUNE 1919.

June 3.

- No. 125,611, to GEORGE BORGFELDT & Co.
Trade-mark for hair, hat, cloth, bonnet,
hand, and tooth brushes with handles
and backs of pyroxylin.
No. 125,658, to H. D. JUSTI & SON. Trade-
mark for artificial teeth.
No. 125,715, to WINGATE CHEMICAL CO., LTD.
Trade-mark for local anesthetic.

June 17.

- No. 1,306,689, to BIRNEY DYSART. Dental
appliance.
No. 1,306,696, to JAMES W. IVORY. Tooth
separator.
No. 1,306,697, to JAMES W. IVORY. Napkin or
roll attachment for rubber-dam clamps.
No. 1,306,816, to WILLIAM R. HOWARD. Syr-
inge for injecting cement in teeth.

- No. 1,306,933, to ALBERT G. TILLMAN. Tooth-
brush holder and sterilizer.
No. 1,306,998, to VLADIMIR T. DIMITROFF.
Dental instrument.
No. 53,453, to CONVERSE W. LLOYD. Design
for toothbrush.
No. 125,857, to WILLIAMS BRUSH CO. Trade-
mark for toothbrushes.

June 24.

- No. 1,307,382, to FREDERICK L. STANTON and
GILBERT D. FISH. Means for placing
teeth in correct positions.
No. 1,307,446, to MATHEW M. KERR. Dental
instrument.
No. 1,307,530, to ALBERT WOLF. Folding
toothbrush.
No. 1,307,709, to WESLEY L. SMITH. Shade
guide.



DR. JOHN F. DOWSLEY.

THE DENTAL COSMOS

VOL. LXI.

SEPTEMBER 1919.

No. 9

ORIGINAL COMMUNICATIONS

Ultero-membranous Gingivitis, the Gingival Phase of Vincent's Disease.

By CLARENCE J. GRIEVES, D.D.S., Baltimore, Md.

(Read before the Maryland State Dental Association, at its annual meeting, June 11-13, 1919.)

A GREATER appreciation of the gravity of this gingival disease by the dental profession is an urgent need. Its importance is due to the fact that, with the exception of lues and diphtheria, this affection is admittedly the most contagious and infectious of all mouth and pharyngeal diseases; it is universally distributed, and "is not selective of sex, social condition, occupation, or seasons." A prominent medical authority recently in describing its treatment said, "A good dentist is one of the best therapeutic measures." The present paper is an effort to briefly assemble recent data, to the end that we may be "good dentists," in both diagnosis and treatment.

Any survey of the literature of gingival Vincent's disease, the care of which should especially be the dentist's business, is at present quite discouraging from the dental viewpoint. With few exceptions, all the recent studies are by

medical men. The writer recognizes this in quoting freely from the work of Campbell and Dyas, McClintock, Bouty, Taylor and McKinstry, Kellerman, Tunnicliff, and particularly Barker and Miller, for the medical side, and Gilmer and Hinman for the dental side. He makes no claim of originality, except that the report of the facts here cited is the result of the study of two hundred cases in which the etiology and treatment suggested by the authors quoted were observed and checked from the standpoint of the dentist. As Barker rightly remarks, this disease constitutes "a very expensive invalidism which is wholly preventable." Mistaken for pyorrhea, it has been considered sufficient cause for the classification, "unfit for military duty" by draft boards, and "survey" or discharge in the navy—so that at this time too much emphasis cannot be placed upon its infectious and contagious character.

CONTAGIOUSNESS OF VINCENT'S GINGIVAL DISEASE.

Large groups of men, coming from the close association of camp and ship life, are daily being discharged into our homes, offices, and factories, and the average dentist will be expected, by his medical *confrères* and the laity, not only to recognize and treat these lesions promptly, but also to outline a prophylactic *régime*, if we are to prevent these sporadic cases from spreading into an endemic; and it will be a serious reflection indeed on the dental profession if this situation cannot be met successfully.

While not necessarily a military disease, its contagiousness is always demonstrated in every closely associated assemblage of younger individuals in dormitory or barrack life, using a common kitchen or galley and mess gear, table utensils and linen, food, and toilet articles. It can occur from the "swapping" of pipes, cigars and cigarettes, toothpicks, pens, lead pencils, money, mouth organs and musical instruments (involving frequently an entire band), chewing gum and candy, kissing, etc., in fact by any means of salivary contact, which is generally most infectious. Thus it becomes peculiarly the soldier's and sailor's disease, and especially the mouth and throat disease of the navy. It is doubtful if Vincent's disease has ever been eradicated from merchant and navy vessels, and unquestionably a large percentage of the old ships' disease known as "scurvy of the gums" was its gingival expression. The writer has known twenty-four cases to develop in forty-eight hours in otherwise apparently normal mouths from one cook, later discovered to be contaminating the barrack galley; therefore every precaution should be taken to rule it out of the hospital, by rigid mouth inspection of cooks and kitchen attendants, scrubbers and operating-room orderlies, nurses, and interns generally. No one with gingival Vincent's disease, or pyorrhea for that matter, from the chief surgeon down to the

scrubwoman, should be allowed to work in an operating room.

State, municipal, and local health authorities should be instructed, and in turn instruct, in the dangers of dissemination, and should enforce rigidly the existing laws or pass new ones controlling promiscuous use of drinking-cups in schools, etc. They should also issue notices warning the public of the dangers of the family use of cooking and table utensils, linen, etc., all of which should be thoroughly boiled, as the casual dishwashing and laundry are quite insufficient. This must especially be impressed upon cooks, dishwashers, and waiters at soda fountains and in restaurants and hotels.

As an illustration of the large part that barrack life plays in this connection, Hinman was able to study in 1916 not more than forty cases from years of practice; periodontologists report only an occasional case in civil life except those proceeding from an infected college or dormitory. In thirty-one years of dispensary and private practice the writer had seen but few cases, yet he was able to observe two hundred in six months' naval duty, while in six months' service on the Medical Advisory Board, examining about one hundred drafted men per week, such lesions were rare.

HISTORY—CLASSIFICATION— TERMINOLOGY.

The history of Vincent's disease, like many others, is of interest because in its record we may review and correct the etiology. The fusiform bacillus and spirochete, always found in the tissues destroyed, were first discovered by W. D. Miller (1882) as common mouth organisms; later, associated by Babes (1884) with tonsillar lesions. Vincent and Plaut (1894-96) found these forms constant in hospital gangrene and throat pseudo-membranes; Vincent's name was thus linked with the "angere" or choking spasmodic pain which these lesions produced, and much was then written of "Vincent's angina."

Authentic cases are recorded of pseudo-membranous ulcers of the gastrointestinal tract, bronchi, lungs, and genitalia, where these forms were considered the primary factors. The micro-organisms appear in the masses of pus in empyema, in gangrene, and as a terminal infection in death from many diseases and from putrefaction generally. Barnes states, "The most destructive and fatal forms of gangrenous necrosis, in which the fuso-spirillary forms occur, are the essential blood diseases, as leukemia, etc." There is little doubt that gangrenous stomatitis, cancrum oris, and noma—all frequently fatal in ill-conditioned children—are produced by such micro-organisms. Outside of the original work of Gilmer, Hinman, and Tunnichiff, who were among the first to recognize the gingival type of Vincent's disease in reports of sporadic cases, this disease attracted little attention until the promiscuous association of camp life during the war, where it appeared as an epidemic, and has been studied by the authorities quoted, including Bouty, who, for instance, found these fuso-spirillary forms producing 29 per cent. of all cases of ulcerative stomatitis (viz, "trench mouth," "trench gums," "trench throat") among the British and French troops.

Campbell and Dyas classified 129 cases as follows: Type 1, involving the tonsils; type 2, about the third molars; type 3, gingival cases; type 4, generally involving the buccal cavity. Taylor and McKinstry consider the gingivæ, mucous membranes, and tonsils, in the order named, as the primary points of invasion, and Bowman very sensibly insists that we should speak of the whole as Vincent's disease. Barker and Miller, in a quite recent and comprehensive article, confirm Bowman's idea, suggesting the following terms to describe the subdivisions: Vincent's angina, for tonsillar lesions; Vincent's stomatitis, where the mucosa are invaded; Vincent's periodontal gingivitis, denoting a gingival invasion—which latter they *very correctly consider the primary lesion*.

PATHOLOGY.

Since that terminology is most valuable which best expresses the pathology—diseases being best classed by the tissues involved and disturbance of function—Gilmer's term, "ulcerous gingivitis," improved by Tunnichiff to "ulcero-membranous gingivitis," appeals to the writer as most exactly describing, clinically, the tissue change. This must, of course, be subdivided into acute and chronic phases, *for the chronic, while not painful, is the more dangerous*. The acute onset is marked by an itching gingivitis, with the crests of the gingivæ engorged, but not especially hemorrhagic, rapidly followed by the formation of necrotic pseudo-membranes, which mass interdentally, the whole crest being abruptly sectioned horizontally, and sloughing, *as in arsenical necrosis, with the presence of much pain, which is the principal diagnostic factor*. This process repeating progresses rapidly labially, buccally, and lingually. The membranes show in the mass pure cultures of fusi-form bacillus and Vincent's spirochete; these rapidly but uniformly invade the periodontal membrane and alveolar crests, the tissues and vessels alike becoming gangrenous. There is a progressive necrosis of the alveolus, and frequently hemoptysis from the invaded vessels, particularly in the maxillary bicuspid region.

The initial lesions occur generally in the median gingival crests between the maxillary and mandibular incisors, or about the third molars, especially in cases of delayed or faulty (impacted) eruption. Continued cheek contact rapidly develops deep pseudo-membranous ulcers opposite to each infected interdental space, thus creating an ulcero-membranous stomatitis. These ulcers may coalesce, progressing to a gangrenous stomatitis, or invade the periosteum, producing maxillary or mandibular necrosis—all frequently fatal; or may involve the floor of the mouth and tongue laterally, simulating Ludwig's angina, or may progress pharyngeally, attacking

the tonsils, and produce a Vincent's angina.

DIAGNOSTIC SYMPTOMS.

All of these processes are accompanied by fetor and salivation, drooling of bloody saliva at night, and occasional enlargement of the submaxillary or sublingual glands and lymph nodes. Varying degrees of constitutional symptoms accompany the acute stage: Temperature 100–102°, nausea, loss of appetite, malaise, lack of "go," headaches, etc. Barker and Miller give the differential diagnosis as follows: "The patient should be sicker than he is, considering the local symptoms." This disproportion, with a low leucocytosis (10,000) as compared with the high count in tonsillitis, the membranous rather than follicular lesions, and the smears, which are fuso-spirillary rather than pyogenic, mark the Vincent's invasion. The same contrasting clinical picture is true of diphtheria, except that it, like Vincent's disease, is membranous, but does not involve the mouth. The slides are Gram-positive for the *B. diphtheriæ*, Gram-negative for the fuso-spirillary forms, and the regularly associated spirilla are characteristic. Of course Vincent's disease may be coincident with diphtheria, as it may with syphilis, or it may result from anti-syphilitic treatment where mercury is used. Dark-field illumination, however, will always detect the *treponema pallida*, and notwithstanding the doubt expressed as to the reliability of a differential Wassermann, Taylor and McKinstry, after a complete review of all the evidence, remark: "When a Wassermann reaction is positive in Vincent's, then a double infection exists, either as coincident syphilis or Vincent's, or as the occurrence of Vincent's in a subject with latent syphilis."

Considerable doubt still exists as to whether *B. fusiformis* and Vincent's spirochete are morphologically different organisms, or different life phases of the one organism; this is hardly so important clinically as the question of specificity, which is still unsettled. Miller states that normally "They may

be innocuous symbiotic saprophytes, capable under special environment of causing pathologic changes; possibly under conditions necessary, as for the tetanus bacillus, requiring both ancillary organisms and local damage." He asserts, however, that "No matter where located, the lesions of Vincent's disease are caused by the activities of *B. fusiformis* and associated spirochete." In the acute stages, pus as such does not appear, though pus cells are present in the necrotic masses; but in the chronic stage, after much destruction of deep tissues, exudates appear—this is undoubtedly a secondary infection by ordinary pyogenic cocci. It is these chronic cases which are frequently mistaken as primarily pyorrhea, while as a matter of fact they are *secondary exudative gingival disease*, constituting the most serious dental sequela of ulcero-membranous gingivitis.

In the writer's opinion it is the study of the chronic rather than the acute phase of Vincent's disease which has confused the etiology, and led to such statements as Moody's, who questions fuso-spirillary specificity on the ground that anaerobic streptococci are always present. Even in chronic lesions such is not the case, the presence of the anaerobic streptococci being due to a technical error in collecting material for slides. If the material is obtained superficially it will show coccal forms, but in the writer's experience, *if mouth debris be blown from the gangrenous subgingival space, and smears made from the actual membranes lying on the hemorrhagic sub-tissues, the predominance of fusiform bacilli and spirilla is so striking as to leave no further question as to the actual pathogenic factor.* It is these chronic cases which are also the so-called "healthy" but really dangerous carriers. Pain, the principal diagnostic factor of the acute stage, is past; *pyorrhea gives no pain, and those having it are often unaware of the fact*—hence, at this stage, it is most difficult to rule out, because the superficial exudate masks the pseudo-membranes lying deep in the pockets, and in this exudate may appear many coccal strains.

IMPORTANCE OF DIFFERENTIATION BETWEEN PYORRHEA AND VINCENT'S GINGIVAL DISEASE.

The group of gingival diseases known as interstitial gingivitis, or pyorrhea alveolaris, however, must be sharply differentiated from ulcero-membranous types, because the latter are contagious, while pyorrhea has not been so proven. Whatever the varying theories, pyogenic gingivitis, due to coccal forms—principally streptococcus deep in the tissues and staphylococcus superficially (Hartzell and Henrici)—is a hemorrhagic or suppurative disease with pus, serous or fibrinous extravasation and exudative phases predominating. Fusio-spirillary gingivitis is always primarily a necrotic or pseudo-membranous disease, and there could be no better confirmation of the etiology of Vincent's disease than this constant tissue reaction to the fusiform bacillus and Vincent's spirochete.

Kellerman has proved that these forms may be implanted on previously damaged or infected tissues, while all attempts at implantation of pyogenic cocci to produce pyorrhea (best illustrated by Talbot's and Hecker's experiments) have failed. The writer has confirmed this fact, and calls your attention to *trauma with retention of the damaged tissue in the gingival pocket as the determining localizing factor* in this disease. The initial lesions invariably arise in those gingivæ continually exposed to food or other agencies of trauma—as e.g. the lingual exposure of the median maxillary incisor gingival crest, all crests about the mandibular incisors, the deep incompletely protected subgingival tissues of the slowly erupting third molar group, or any gingiva unduly exposed by malocclusion, especially about the cervical overhang of ill-contoured and ill-adapted fillings and crowns. We have frequently observed the direct implantation of fusio-spirilla into normal gingivæ by an over-zealous but uninformed operator damaging normal crests in removing calculus using the same instruments previously used in Vincent's pockets, and developing typical mem-

branes in several hours in such septa, thus creating a direct infection.

DANGER OF INSTRUMENTATION.

It is well, therefore, *to accent the precaution that no wounds be made, or tissue damaged, during any phase of Vincent's disease.* The cleaning and scaling of teeth, root-canal treatment, exodontia, or any mouth surgery, is absolutely contradicted—for serious cervical cellulitis, periostitis, and gangrenous necrosis, involving the maxilla and mandible, occasionally result therefrom. Dental calculi invading the subgingival space might be considered as creating septic trauma, and unquestionably this occurs occasionally. All people have areas of deposited salivary calculus, yet not all people have either pyogenic or ulcero-membranous gingivitis; nor do these septic deposits, plus mouth debris, produce either condition in a goodly percentage of filthy mouths. However, retention of putrefying food and tissue about such concretions always creates an area of lowered resistance which may at any time present exudative or ulcerative pathological conditions.

The cause of sporadic Vincent's disease seems to be a mystery. Generally lowered resistance has been suggested as the cause in the 200 cases out of 400 prisoners in German camps reported by one of the writers quoted. The lowered resistance which keeps patients in hospitals, chronicity wards for instance, is not a factor—for this disease is invariably brought into and does not arise in the hospital; though when once established, unless recognized and promptly checked, it progresses with the rapidity of hospital gangrene. The lowered resistance which mystified the local draft boards to the extent of causing them to ask a large percentage of consultations of the medical advisory boards, and which in turn disqualified 15 per cent. of such men, did not predispose to this disease, for in the writer's experience it was rare, while the percentage of exudative gingival disease existed as usual.

It is quite evident that something acts to raise to a pathogenic point the viru-

lence of the *B. fusiformis* and the spirilla which W. D. Miller described as common mouth forms associated with dental caries, covering all oral surfaces. These strains are forced into the tissues every time a wound is made or irrigated in the cleansing, filling, or extracting of teeth, yet Vincent's disease does not follow. Even in the treatment of pyorrhea, with any amount of infected gingival tissue and with the common mouth fusospirilla always present, *necrotic ulcerations do not result, unless there be other Vincent's lesions*; nor is there any noticeable difference morphologically in the open-mouth types and those recovered from lesions, while all other cultural characteristics are indeterminate.

Further laboratory confirmatory work in this direction is needed. So far it has been shown that ulcero-membranous gingivitis is highly infectious, that it may be implanted on any normal gingiva if the cells be sufficiently damaged, especially if there be little hemorrhage or exudate and at the same time retention, interdentally, of such damaged tissue and mouth débris. It is also established that younger people are peculiarly susceptible, while it is well known that pyorrhea is not a disease of the young, but of middle life; so the statement that it usually results from pyogenic or suppurative gingivitis is hardly correct. It is therefore better hygienically and much safer to assume that the larger percentage of Vincent's disease results from direct infection or salivary contamination, and usually a little investigation will be rewarded by the discovery of the contagious source or carrier. Preventive hygienic work in such cases therefore is always well worth the trouble.

CHRONIC METAL POISONING AS A CAUSE.

Spontaneous cases do unquestionably arise, and chronic metal poisoning has been indicted in this connection. All of the authorities quoted, except Gilmer, warn against continued administration of mercury during an attack of Vincent's disease, claiming that it often induces and almost always prolongs the attack. They note also that it generally results

from or is associated with salivation when mercurials are administered to the "saturation point"; that it frequently occurs as a puzzling oral complication in the mercurial treatment of lues; and the anti-syphilitic treatment of the military camps is believed by many to be the cause of endemic Vincent's disease among soldiers and sailors.

Gingival Vincent's disease frequently follows, and is one of the symptoms of lead and zinc (brassfounders' disease) poisoning. In all these conditions, as is well known, these metals are deposited in the final capillary vessels and adjacent tissues of the gingival crests, appearing as a dark line. Potassium iodid, in increasing doses, will produce a gingivitis, involving the end arteries; in fact, the old treatment prescribed such metals, "till the gums had been touched"—very obviously not locally, but by way of the blood stream. It is therefore a peripheral tissue disturbance, evidently of central origin. In this connection, Talbot's lucid description of the vascular conditions produced by him in experimentally feeding these metals to dogs is interesting. He details the changes observed in all the terminal vessel coats, beginning with the intima—the degenerative endarteritis resulting in obliteration and tissue stasis; the tissues, loaded with waste products, degenerate and become necrobiotic, and the localized degeneration of all vessels and nerves results in a low-grade inflammation. He insists that very similar arterio-sclerotic changes occur in the gingival vessels from toxemias, especially of the gastrointestinal type. All of which, if granted, again admits some central disturbing cause involving the circulation.

PREDISPOSING ORAL CONDITIONS.

Noyes and Dewey personally and also quoting Roemer, and Hartzell and Henrici, agree as to degenerative and local static vascular conditions, the latter saying: "In the beginning stages of all forms of progressive periodontitis the inflammatory action is always of the subacute character, small mononuclears, lymphocytes with plasma cells, predomi-

nating. The primary change is a productive inflammation, with evidences of degeneration and calcareous masses in the older tissues; *no pyogenic mouth streptococci appear in the tissues, and ulceration and suppuration are purely secondary.*" That spontaneous ulcero-membranous gingivitis may so result, when the foregoing favorable conditions arise in the gingiva, is the writer's firm belief; for stasis has isolated the whole crest from the usual protective vascularity and chemotaxis, so necessary to all healthy mouth mucosa, plus the continued retention of putrefying food debris, which is often driven by bite impact deeply into such crests. But particularly, *it is the retention of this necrotic tissue, through carelessness and neglect of mouth toilet, which furnishes just the ideal anaerobic media, away from the oxidizing pump of saliva, needful to raise the common mouth fuso-spirilla to a real infectious and contagious virulence.*

This is the mouth type predisposing to Vincent's disease. It was common in all military camps, and no doubt it occurred in the hurry and stress of trench warfare, just as, possibly, toxemias resulted from irregular dietary conditions and nervous strain, and may have affected the gingival vessels as a secondary cause. *Oral filth, "generally inexcusable," not oral sepsis, appears to be the real factor.* The term oral sepsis presupposes pyogenic mouth infection or pyorrhea, and is quite another condition, accompanied by exudates or hemorrhagic seepage, freely draining from suppurative pockets, more or less open to the pump of saliva and oxidizing processes prejudicial to superficial anaerobiosis. In Vincent's disease, just as in diphtheria, it is well never to overlook the possibility of superficial tissue necrosis produced by streptococci of such a low virulence as to produce little local protective reaction; on such areas the fuso-spirilla as well as the *B. diphtheriæ* might well lodge.

It is quite true that an ulcero-membranous gingivitis may be implanted in any pyorrhea pocket, as it may in any gingiva under packed, putrefying filth,

but that is far from saying that it results from pyorrhea. When such secondary infection does occur, the results are most interesting. The well-nigh incurable chronic condition rapidly becomes acute, with pain, while the hypertrophic gingiva, and much of the involved alveolus and membrane, over which the dentist has labored long in treatment, are cut away as by a knife in a few hours, leaving the serumal deposits high on the teeth in the interdental spaces. Suppurating surfaces and pus alike disappear (though likely to recur later on reinfection), meanwhile the pyorrhea appears to be cured (?); and we conclude that as compared with pyogenic cocci, fuso-spirilla are rapid actors indeed in tissue destruction. A study of the tissues during an acute ulcero-membranous gingivitis and after recovery—exploratory, radiographic, and otherwise—does not reveal the deep irregular invasion of the alveolus found in pyorrhea. Where the periodental membrane is involved far below the depth of the pockets, along its vascular supply, the alveolar partitions disappear by lacunar absorption or halisteresis; and the large bone areas destroyed are replaced by granulation tissue with deep ingrowth of epithelium, simulating malignancy. Quite the contrary occurs in the ulcero-membranous types. The margins become necrotic and liquefy on a horizontal plane with no deep irregular invasion. All parts are involved alike, regardless of type, and fade away equally to an abrupt wall (which may be covered superficially by epithelium) underlying which, even when lost to the middle root-third, the tissues appear almost normal; for the teeth are firm, there is no deep chronic periodontitis, the alveolus is dense, and the lamina dura radiographically visible. If proper treatment be instituted promptly—and every day means tissue saved—the prognosis is decidedly more hopeful than in pyorrhea, though the tissue loss is more apparent.

Very serious dental sequelæ result from every attack of gingival Vincent's disease, even when occurring in youth, and the denture, once involved, is never

quite up to normal. The gingivæ may appear healthy, but the alveolar crests, if restored at all, are very susceptible to all types of damage; food pockets arise and persist, and later some form of interstitial exudative lesion, or even pyorrhea, seems almost inevitable. These pockets predispose to cervical dental caries in the cementum, and continued root exposure often induces calcific degeneration of the dental pulp—the formation of pulp stones, with much referred pain and neuroses.

TREATMENT.

The treatment of this disease is most decidedly not by instrumentation, for the reasons already given. No matter how skilled the operator, the membranes will certainly be forced deeper into the underlying tissues or scattered into others, spreading the disease. At the most, instruments should be used only to carefully lift the gangrenous membranes from the sub-tissues with as little hemorrhage as possible. Sprays, under sufficient air-pressure to force the masses from the interdental spaces, are most valuable when applied frequently (every hour) by the patient and operator. The spray should contain oxidizing substances—such as hydrogen dioxid 8 per cent., potass. permang. 10 per cent., potass. chloras, saturated solution, with a preference for the last—as suggested by Hinman. If the membranes are not reduced in forty-eight hours, such spraying should be followed immediately by slight applications of trichloroacetic acid, limited to the surfaces exposed by membrane removal. Tooth pastes containing a goodly percentage of potass. chloras are valuable adjuncts during and after the attack. The internal administration of potass. chloras (gr. v. t. i. d.), with urinalysis every other day, has been helpful, although many question its value and use sodium cacodylate, salvarsan, or liquor potassii arsenitis.

The local application of liquor potassii arsenitis and arsephenamin in glycerin or oil is apparently aimed at the spirachetal forms of micro-organisms alone, and ipecac is used because of the pres-

ence of the amœba. The writer has seen no evidence of specific curative value in any of these remedies, while swabs of iodine, cresol and phenol, zinc chlorid, silver nitrate, silvol, etc., are useless, if not harmful, the gangrenous membranes forming as usual. This statement is proved by many laboratory reports showing no reduction in the fuso-spirilla after such treatment.

The oxidation and sedative treatment, with as little application of caustics as possible, is decidedly preferable; and only after thorough recovery, disappearance of pseudo-membranes, and repair of pockets by epithelium, should the very necessary instrumentation be applied for a complete mouth prophylaxis. Again, too much emphasis cannot be placed upon the necessity for public and family hygiene during any attack of Vincent's disease. Until recovery is assured, the oral prophylaxis should be the same as for syphilis. If isolation be impracticable the patient should be instructed as to the dangerous character of his saliva and be encouraged to assist in preventive measures, that others may not be infected.

If the average medical practitioner could only be so interested in the many expressions of gingival disease that he would not class it all broadly as pyorrhea alveolaris, his advice might prevent the usual family endemic of the ulceromembranous type; and if the average dentist would only pause, before instrumentation, long enough to make and examine a smear, or have a bacteriologic report upon it in doubtful cases, as Hinman suggests, the two classes of practitioners, by such co-operation, could shortly blot out this filthy and entirely unnecessary mouth disease.

BIBLIOGRAPHY.

1. HINMAN. "Diagnosis and Treatment of Vincent's Angina: Report of a Case Involving the Lungs," DENTAL COSMOS, 1916.
2. GILMER. "Acute Ulcerous Gingivitis," *Dental Review*, November 1915.
3. TUNNICLIFF. *Jl. Infect. Diseases*, 1911.
4. BOWMAN. *London Lancet*, January 1917.
5. BOUTY. *Brit. Med. Journal*, 1917.

6. TAYLOR and MCKINSTY. (a) "Relation of Peridental Gingivitis to Vincent's Angina," *Brit. Med. Journal*, 1917. (b) "Seriologic Investigations of Vincent's Angina," *Journ. Laryng., Rhinol., and Otology*, 1918.

7. BARKER and MILLER. "Perforating Ulcers of the Hard Palate Resulting from Tertiary Syphilis," *Journ. A. M. A.*, 1918.

8. MCCLINTOCK. *Journ. A. M. A.*, 1917.

9. BARNES. *Med. Clinics of N. America*, 1918.

10. CAMPBELL and DYAS. "Epidemic Ulcero-membranous Stomatitis (Vincent's Angina) Affecting Troops," *Journ. A. M. A.*, 1917.

11. HARTZELL and HENRICI. "Microscopic

Anatomy of Chronic Periodontitis, etc.," *Journ. N. D. A.*, 1917.

12. HECKER. "Pyorrhea Alveolaris." 1913.

13. MOODY. Disc. of Hinman paper (No. 1 *supra*). DENTAL COSMOS, 1916, p. 1392.

14. TALBOT. (a) "Etiology and Treatment of Interstitial Gingivitis," *Journ. N. D. A.*, 1917. (b) "Interstitial Gingivitis." 1913.

15. NOYES and DEWEY. "A Study of the Pathology of the Peridental Membrane," *Journ. N. D. A.*, 1917.

16. ROSENOW and TUNNICLIFF. *Journ. Infect. Diseases*, 1912.

[Discussion of this paper will be published in our October issue with the proceedings of the Maryland State Dental Association.]

201 W. MADISON ST.

[No. II.*]

Histo-pathology of the Apical Dental Tissues. Abnormal Collateral Arterial Development in the Roots of Teeth.

By EUGENE S. TALBOT, M.D., D.D.S., Chicago, Ill.

IN these days of anxiety in regard to the perfect filling of the roots of the teeth, the question naturally arises in the mind of every practitioner, Can it be accomplished? Another question quite as important immediately follows: If the pulp canal is perfectly filled, is that all that is required to produce permanent results without pathologic changes about the roots?

In my paper on "Bone Absorption Around the Roots of Teeth" published in the May 1919 Cosmos, I showed that the least irritation in the treatment and filling of the roots, or from the escape of gases from decomposed tissue after the root was filled, would cause pathologic changes to take place in the root, the peridental membrane, and the alveolar process.

There are two sources of decomposi-

tion and irritation after the pulp chamber has been successfully filled—namely, abnormal collateral arterial development, and the abnormal development of the granular layer of Tomes, each of which will induce discoloration and destruction of tooth substance, causing it to become brittle. The granular layer of Tomes will be considered in a future paper.

The teeth, like all structures of the body, must be studied from an evolutionary point of view to appreciate the abnormal changes which take place in their development.

There are three sources of abnormal collateral arterial development in the root of a tooth: *First*: From the primitive arterial circulation in the formation of the different tooth structures. *Second*: From the pulp through the vaso-dentin to the surface. *Third*: From

* This article is one of a number prepared after twelve years of microscopical research upon animals and human beings. The first paper was published in the Cosmos for May 1919.

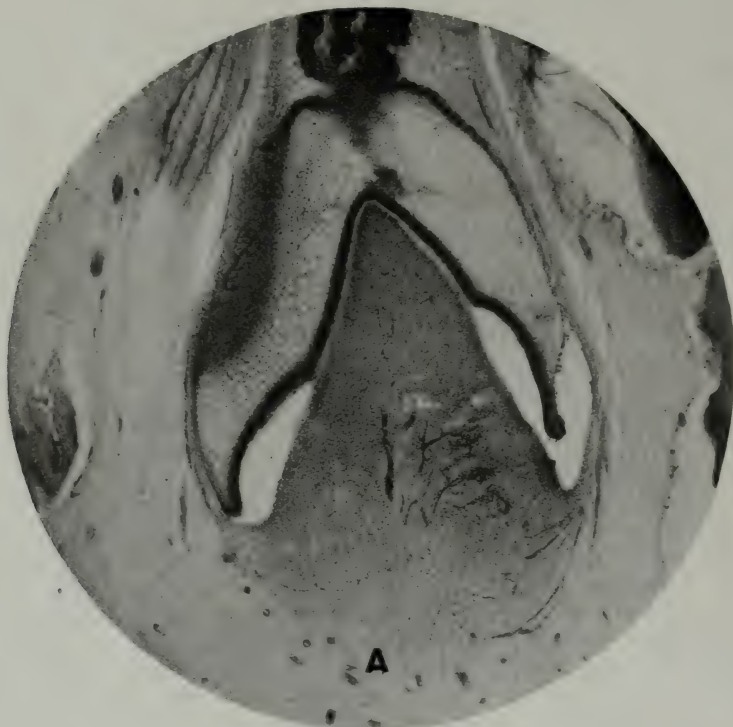
the dental papilla in its evolution from the lower to the higher vertebrate types.

All these three types are abnormalities in the human which might be called useless scaffolding left in the tooth while structures are being built to meet higher vertebrate requirements. They are called "atavisms."

The material for this paper was obtained from sheep, dogs, and humans.

may be seen. In the substance of the papilla are seen arteries for the nourishment of the structure and also for furnishing the lime salts to be formed into dentin. At the base of the papilla at A will be seen a number of black spots. These are arteries. Here is an instance of details being sacrificed for a larger area. This is necessary to show the surrounding tissues. The arteries, as we

FIG. 1.



(Magn. 34.)

SOURCES OF ABNORMAL COLLATERAL ARTERIAL DEVELOPMENT.

First: "From the primitive arterial circulation in the formation of the different tooth structures."

Fig. 1 shows the development of a deciduous cuspid tooth in a child at birth. The different tissues are readily seen. The dental papilla is taking its place, and the outline of the tooth to be formed

shall see in other pictures, form first and always mark the base from which the root in all teeth starts to develop. The pulp of the tooth which forms the dentin starts and grows upward and downward from this nidus of arteries. Some of these arteries join those which are seen in the center of the pulp tissue. They play an important part in pathology and must not be forgotten.

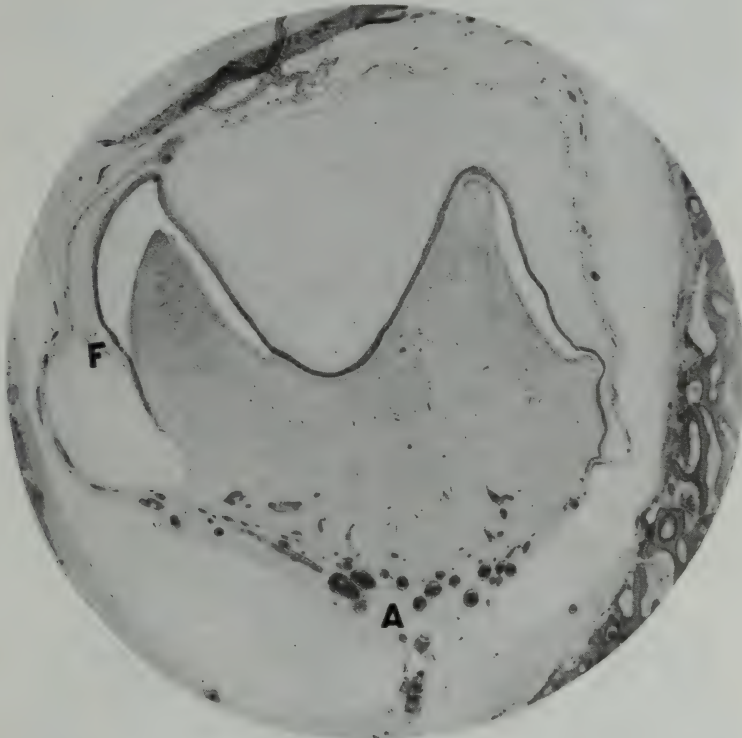
Fig. 2 illustrates the papilla and

surrounding tissue of a first deciduous molar of a child at birth. The nidus of arteries is a little farther advanced and is so characteristic that when once seen it could be recognized anywhere. So early in the formation of structure has this picture been taken that the fibrous sac has not yet fully formed. This sac starts at the nest of arteries and proceeds

very tip of the cusp under the enamel organ. The bone can be seen at the right following the fibrous tissue (*trabeculae*), which always forms first. The only attachment for the dental follicle is at its base, and may be seen in the picture beneath the nidus of arteries.

Fig. 3 is the end of a root of a dog's tooth in its formation: A is the alveolar

FIG. 2.



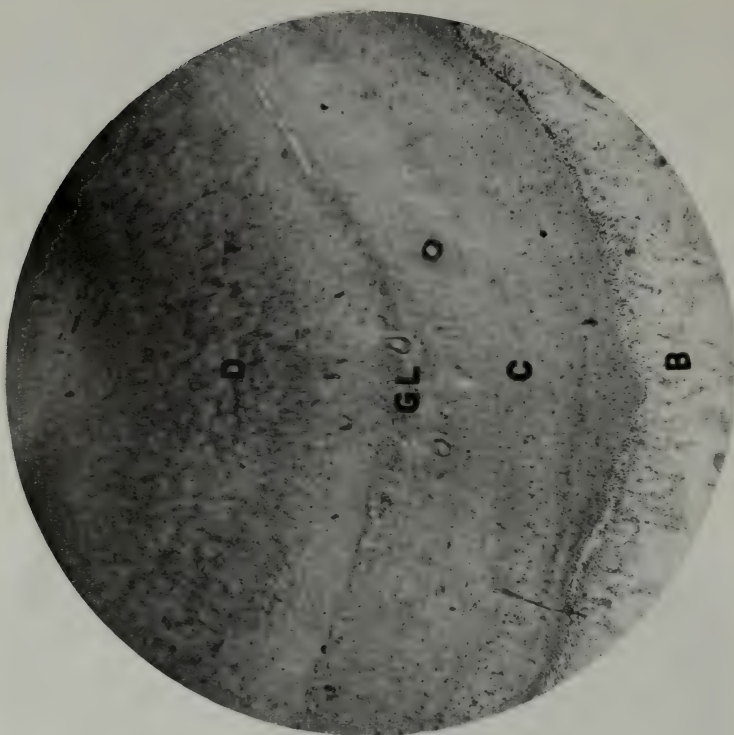
(Magn. 17.)

to develop around the embryonal dental tissues as seen in Fig. 1. The fibers are just developing at the left of the picture at F. The inner layer of the epithelium is molding itself around the dental papilla, while the outer layer is some distance above.

The odontoblast does not change into formed dentin until the enamel organ comes in direct contact with it. A small portion of dentin may be seen with a hand magnifying glass, forming at the

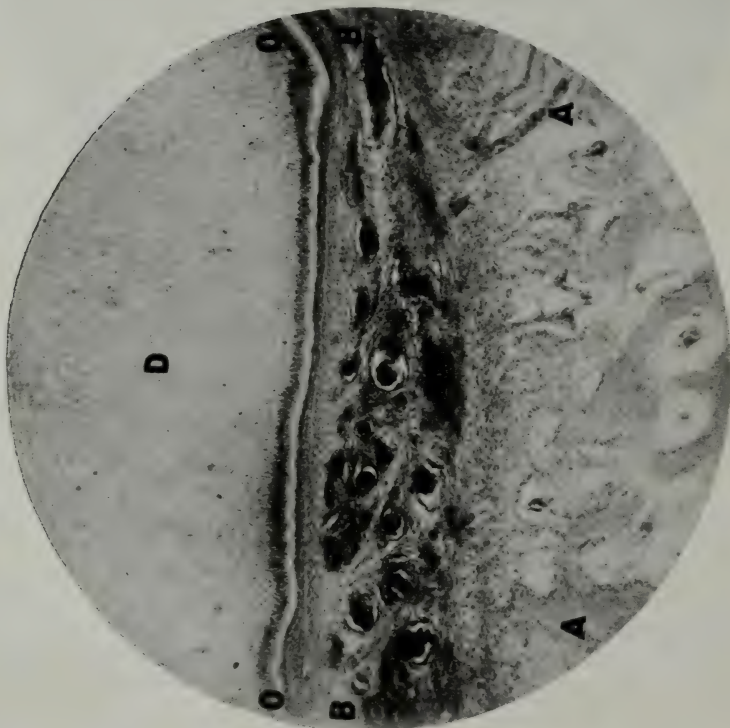
process, B the fibrous sac, eventually the peridental membrane, D the dentin papilla, O the odontoblastic layer that has just formed along the end of the root. The dentin has not yet developed. The fibrous sac, containing a large nidus of bloodvessels, is readily seen in the center of the picture. These bloodvessels not only nourish the papilla to form dentin, but also in a measure the fibrous sac which eventually supplies the cement. This locality, then, is the base of the

FIG. 4.



(Magn. 40.)

FIG. 3.



(Magn. 60.)

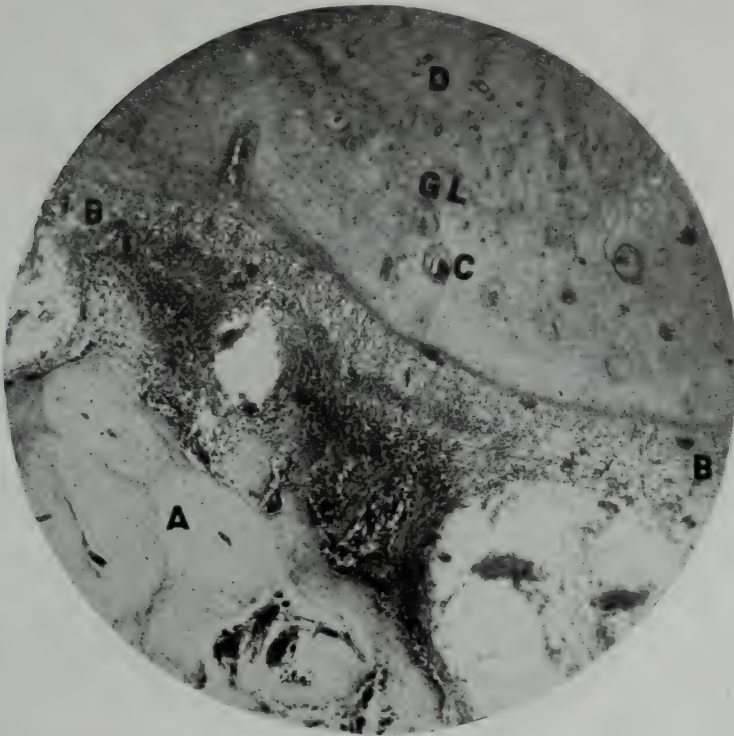
blood supply for the development of all the tissues contained in the sac. The bone is developing and encroaching upon the sac wall, which crowds the arteries into a smaller space against the dentin.

The inner surface of the sac wall now becomes specialized and layers of cement are deposited near and upon the new-

a dog: B is the peridental membrane, c the cementum with six or eight arteries and spaces, D the dentin, and GL the granular layer of Tomes with one artery in the center of the picture.

Fig. 5 is the apical end of the root of a tooth of a lamb: A is the alveolar process, B the peridental membrane, c the cementum filled with arteries, D the den-

FIG. 5.



(Magn. 50.)

formed dentin. As the layers of cement are laid down the arteries are caught in the matrix and when fully developed often many arteries are caught and held in its substance. These arteries are not unlike Haversian canals in bone. They do not, however, nourish tooth structure like the Haversian canals, since the method of cement formation and nourishment is quite different from that of bone.

Fig. 4 is the apical end of a tooth of

tin, also filled with arteries, and GL the granular layer of Tomes, with a row of arteries located between the dentin and cementum. The apical foramen is also seen. It frequently occurs that arteries in the primitive state of dentin development are caught by the first row of odontoblasts which form in and among the nidus of arteries and are therefore found in the dentin, as many of my pictures show. It is not uncommon to find arteries located in the granular layer of

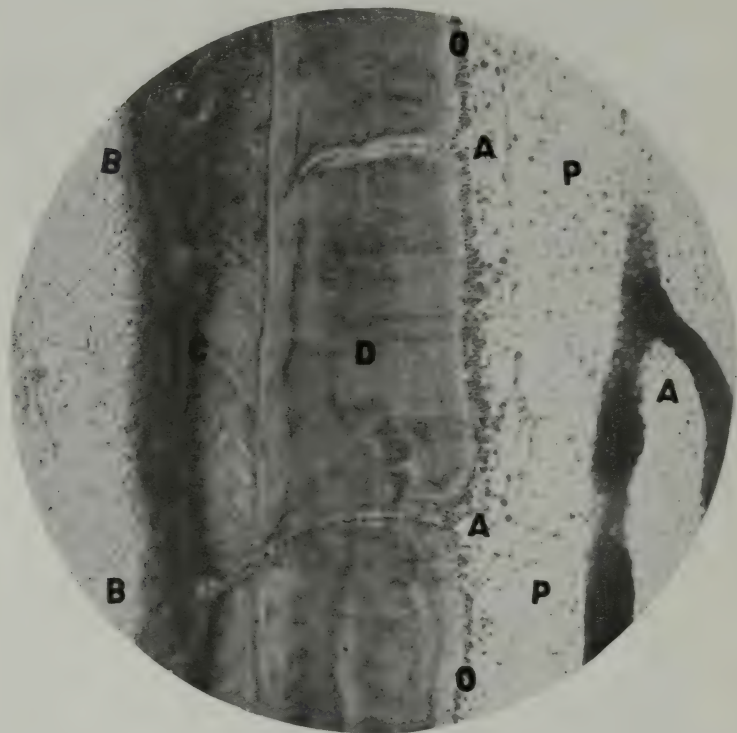
Tomes at all localities along the root, as we shall see later in human teeth.

Second: "From the pulp through the vaso-dentin to the surface."

Tomes* has shown that in the dentin of many fishes there is what is called "vaso-dentin." The formation of the dentin is not solid like that in the higher vertebrates. It is permeated with a system of capillaries, through which red

lost, and solid structure develops. The pulp becomes more simple in its development, with only one opening in the tooth, located at the apical foramen. The primitive tooth in its evolution up to the human, like all structures of the body, frequently retains some of its original characteristics. The vaso-dentin in the fish, therefore, may be found in any of the higher vertebrates.

FIG. 6.



(Magn. 85.)

blood circulates. The pulp chambers are conical and the pulp can be removed without difficulty. The flounder, cod, and hake are illustrations. This vascular network of bloodvessels in the dentin is a normal condition in the lower vertebrates. Many illustrations are shown.

In the evolution of the tooth toward the higher vertebrates this vaso-dentin is

Fig. 6 is the side of the root of a tooth of a sheep midway between the crown and apex: B is the peridental membrane, C the cementum, D the dentin, P the pulp, O the odontoblastic layer forming dentin, and A arteries—A at the right shows a branching artery in the pulp, and A at the left shows two arteries in the vaso-dentin which exactly correspond with those in the fish. These arteries extend from those in the pulp

* "Dental Anatomy." Fourth edit., p. 57.

through the dentin and cementum to the surface. These are commonly found in human teeth.

Third: "From the dental papilla in its evolution from the lower to the higher vertebrate types."

In discussing this form of abnormal development we must have in mind what is understood as a persistent dental pulp. In certain lower vertebrates there are open foramina at the apical end of the root which emit the full-size pulp tissue. As we ascend to the higher vertebrates the apical foramen gradually grows smaller and smaller, until in the human it is as small as a very fine needle through which only one or two small nerves and bloodvessels pass.

In this evolution of the pulp tissue from the dental papilla, odontoblasts deposit upon its surface dentin which encroaches upon it. Occasionally a strong healthy artery will become caught, and the dentin will form around it, as noticed in the second classification, the vasodentin. The dentin begins to form first in the crown portion, and extends along the outer surface of the dental papilla to the end of the root. In the higher vertebrates, normal development precludes arteries extending through the sides of the roots. When they do occur, as I have already shown, they are atavisms.

Quite a different condition exists in the cementum. Beginning there in most cases at a point between the dentin and the cementum at the granular layer of Tomes, the arteries begin to branch. Many of these arteries remain in the free space of the granular layer, as we shall see.

Occasionally, however, they start to branch higher up in the dentin. The cement is deposited quite differently from the dentin. The arteries are caught and held in the cement while in their natural position, which is always fan-shaped in the soft tissues. They retain this position after the dentin and cement are fully formed. Sometimes there are only two separate openings at the apical end. They may be located close together or they may be wide apart. I have

counted as many as eighteen separate openings in one section, and the following pictures will show from eight to twelve arteries running through the dentin and cementum.

Perhaps the best way to describe this peculiar phenomenon is to liken it to a waterpot. The spout of the waterpot would represent the pulp canal, the water the bloodvessels. Remove the sprinkler and pour out the water from one opening; this represents the bloodvessels extending through the normal end of the root of a tooth in the higher vertebrate. Now replace the sprinkler and allow the water to pass through the numerous circular holes. The attachment of the sprinkler would represent the pulp canal in the dentin just above the granular layer. The water from the sprinkler represents the many small arteries leaving the pulp canal and passing out fan-shaped in a circular form around the end of the root of the tooth, meeting the arteries in the peridental membrane located at different intervals around the root.

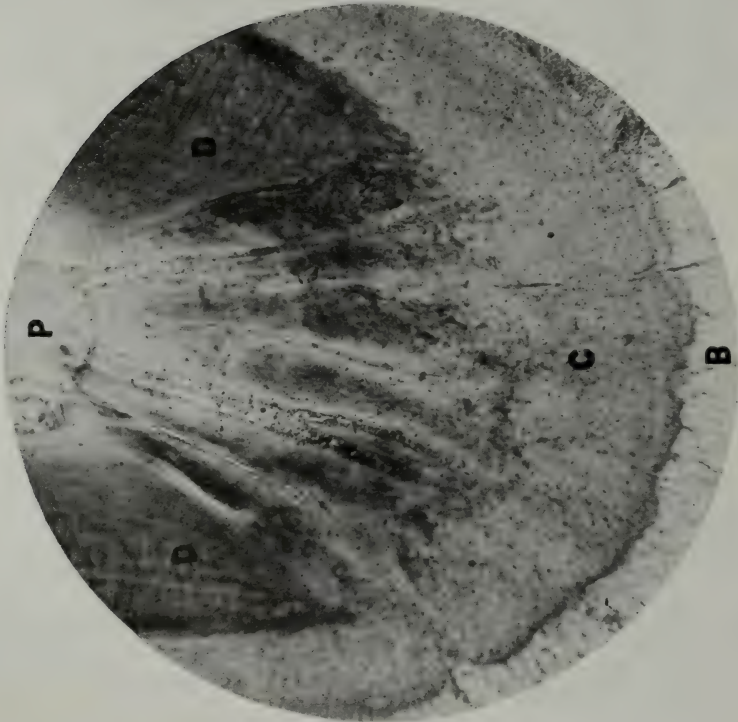
The best methods of studying these abnormal structures is in the order of their evolution—sheep, dog, and man. These conditions are practically normal in sheep, less so in dogs, and not so frequently observed in man.

Fig. 7 is the apical end of the root of a tooth of a sheep. The different structures of the tooth are readily outlined: *B* is the peridental membrane, *c* the cementum, *D* the dentin, and *P* the lower border and the pulp canal. Seven branches of the pulp are given off extending fan-shape through the lower part of the dentin and through the cementum.

Fig. 8 is also a similar picture of the tooth of a sheep with only four branches given off and extending through the cementum: *A* is the alveolar process, *B* the peridental membrane, *c* the cementum, and *D* the dentin.

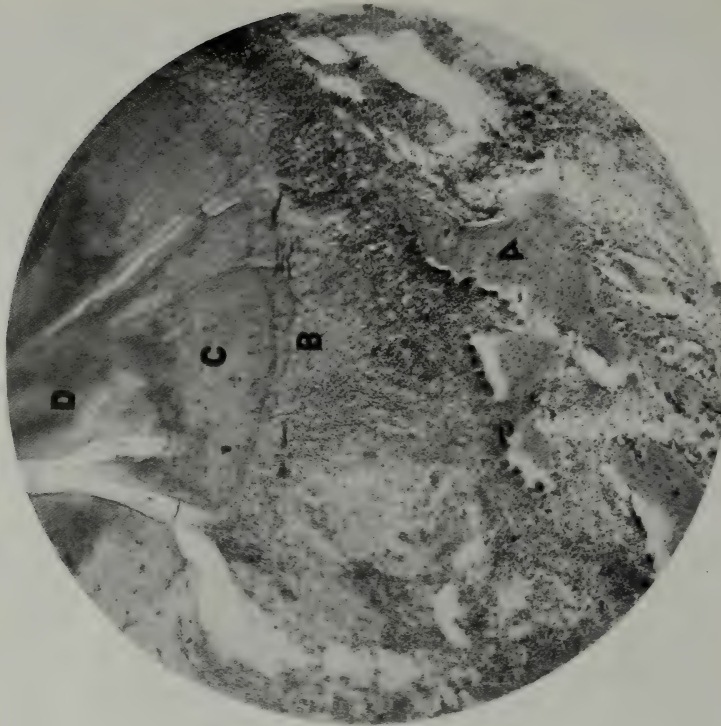
Fig. 9 is the apical end of a cuspid tooth of a dog. The structures are well shown in this picture: *A* is the alveolar process, *B* the peridental membrane, *c* the cementum, and *D* the dentin. Twelve

FIG. 7.



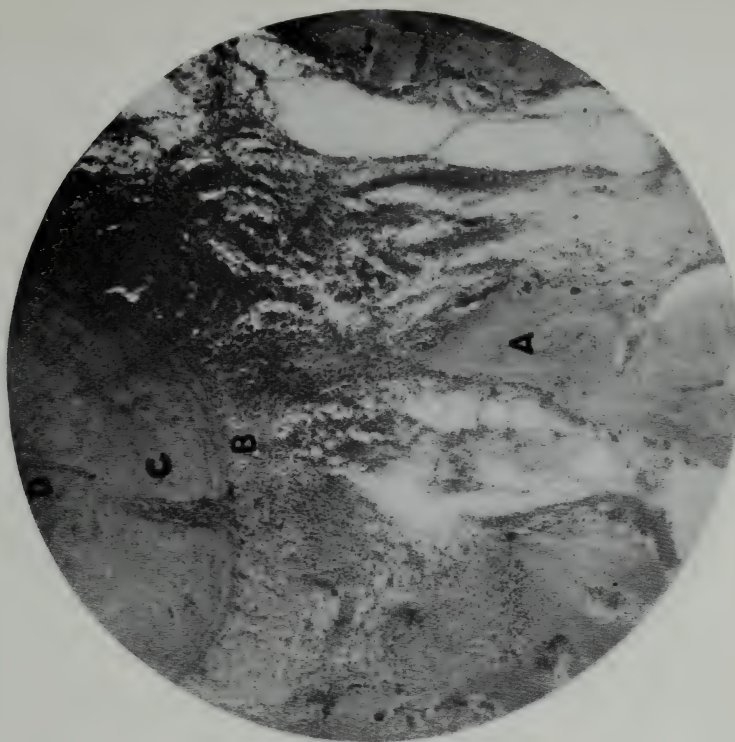
(Magn. 60.)

FIG. 8.



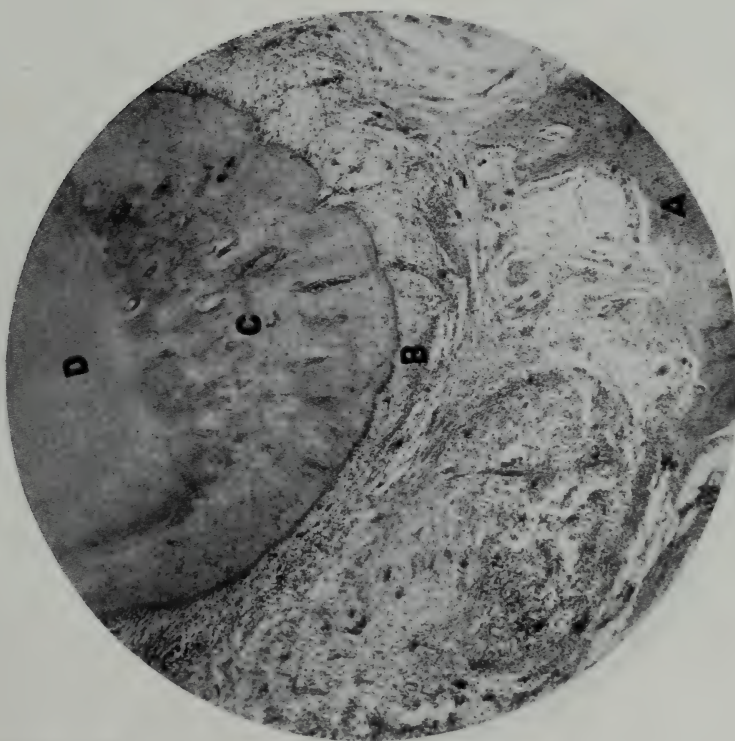
(Magn. 60.)

FIG. 10.



(Magn. 60.)

FIG. 9.



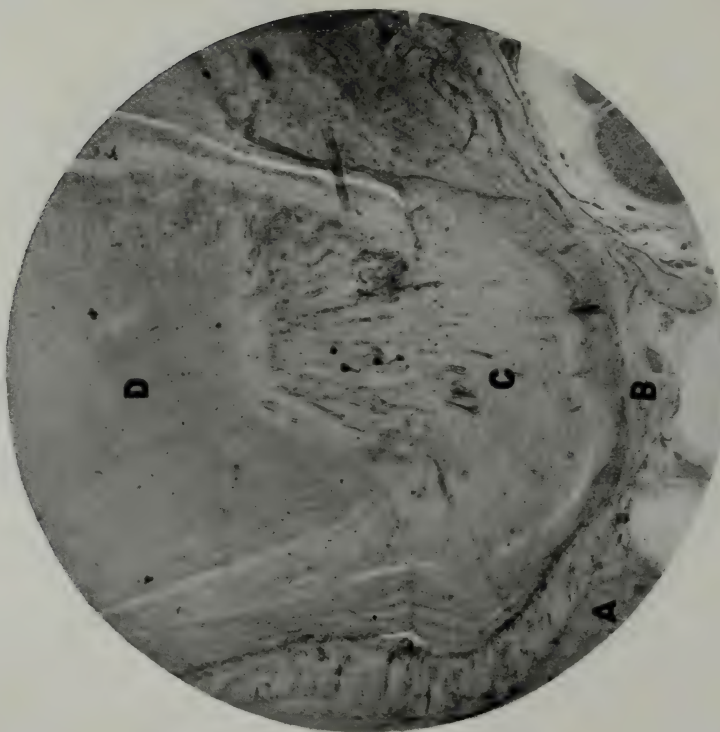
(Magn. 40.)

FIG. 12.



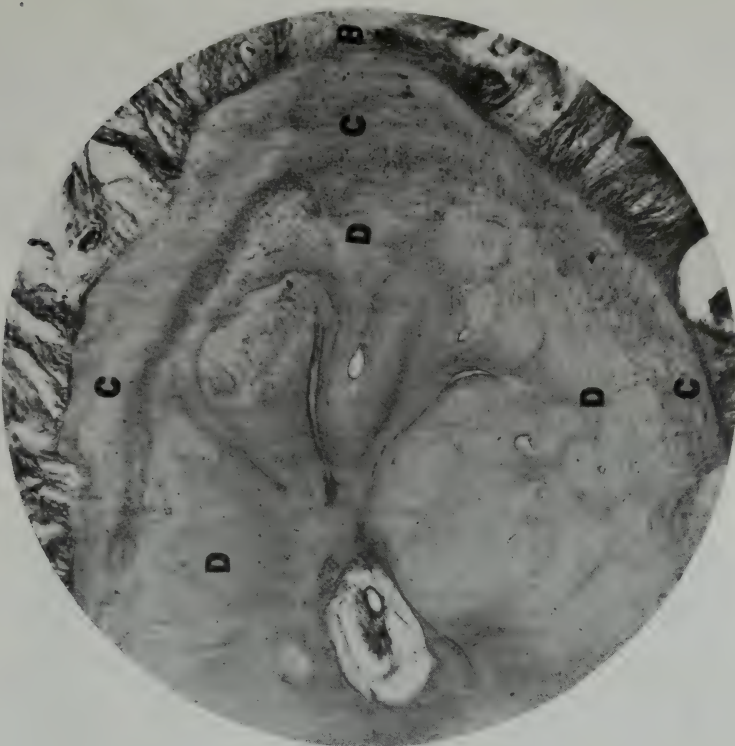
(Magn. 45.)

FIG. 11.



(Magn. 30.)

FIG. 14.



(Magn. 60.)

FIG. 13.



(Magn. 40.)

branches are given off from the pulp, and are well outlined.

Fig. 10 is also the apical end of the tooth of a dog showing only two foramina: A is the alveolar process, B the peridental membrane, C the cementum, and D the dentin.

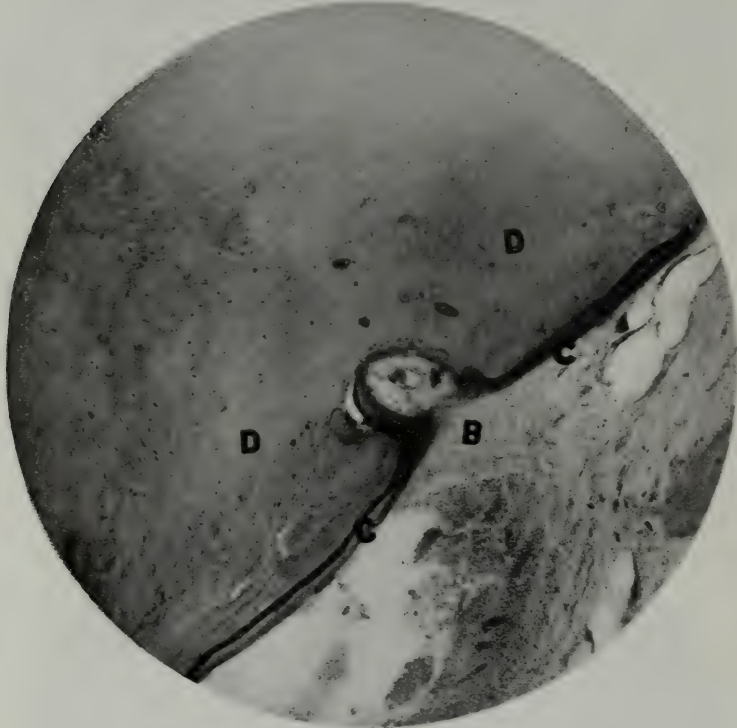
Fig. 11 is the apical end of a cuspid tooth of a dog originally published as a

the dentin and cementum on both sides. Two arteries of the second classification can be seen at the right passing from the dentin across the granular layer into the cementum.

The following pictures are all cross sections of human teeth.

Fig. 12 is the root of a human tooth showing all the structures in position:

FIG. 15.



(Magn. 40.)

frontispiece in my work on "Interstitial Gingivitis and Pyorrhea Alveolaris," in 1899: A is the alveolar process, B the peridental membrane, C the cementum, and D the dentin.

This picture is interesting in many ways. It shows an exostosed root with fourteen arterial branches of the dental pulp. The tooth extends down to and impinges upon the main artery and nerve running through the jaw. The granular layer of Tomes is well outlined between

A is the alveolar process, B the peridental membrane, C the cementum, and D the dentin. Ten branches are given off from the pulp extending through the cementum.

Fig. 13 is also a human tooth, showing an enlarged pulp chamber extending nearly to the end of the root: B is the peridental membrane, C the cementum, D the dentin, and P the pulp chamber. The main foramen is distinctly seen. Three or four collateral branches are

also observed on either side of the main branch.

Fig. 14 is that of a bicuspid tooth: *b* is the peridental membrane, *c* the cementum, and *d* the dentin. The central large cavity is the normal pulp canal. Between this and the outer surface may be seen a number of cavities through which pass collateral arteries. There are also seen three collateral arteries reaching from the pulp canal toward the surface and corresponding to the second classification, vaso-dentin.

Fig. 15 is an artery located near the end of the root of an incisor tooth, situ-

ated in the granular layer of Tomes and the cementum: *b* is the peridental membrane, *c* the cementum, and *d* the dentin. This corresponds with the third classification.

I have a number of pictures and hundreds of sections showing similar abnormal collateral arterial development. The locations, however, differ in different teeth, though all come under some one of these classifications.

The next paper will discuss "The Epithelial Débris Located in the Peridental Membrane and Other Tissues."

31 N. STATE ST.

The Principles Involved in Interchangeable Interdental Splints with Attachment for Extra-facial Tension in Maxillo-facial Surgery.*

By ARTHUR LANKFORD, D.D.S., Baltimore, Md.

(Clinic before the Maryland State Dental Association, Baltimore, June 12, 1919.)

AT the beginning of the great war the treatment of facial wounds differed very widely from the present methods. First, because cases of this type were practically unknown and much detail was to be developed. Second, because the general or plastic surgeon attempted treatment without the co-operation of the dental surgeon. As a result of this lack of co-operation between surgeon and dentist, in the badly wounded cases involving bony structures, many fragments of bone were lost which might have been saved by early and proper splinting, while the remaining fragments were distorted and bound together

in all conceivable positions and finally attached by scar and fibrous tissue, while the soft parts, where there was some loss of substance, were simply kept under irrigation and allowed to retract; this they did, with the formation of scars. Thus a loss of much valuable tissue occurred which might have been saved, leaving the patient with little jaw function and in hideous and pitiable condition. These facts are simply mentioned in order to show more clearly the advantages of the methods of treatment and appliances which will be described later.

When the dental surgeon was called

* This report is based on cases treated at the American Red Cross Military Hospital No. 1, A. E. F., by Lieut.-col. Wm. T. Coughlin, M.C., and the writer conjointly. To Col. Coughlin belongs full credit for all surgery done in connection with these cases, and it was his suggestion that an extra-facial force or pull would be advantageous in maxillo-facial surgery.

to co-operate with the general surgeon he was the first to realize the importance of getting bone fragments into position early, and we all know what good work has been done by the dental surgeon in preventing distortion of the bony structures of the face and jaws; but little or nothing was done to prevent contraction of the soft parts.

As late as the spring of 1918, during a tour of observation of the large French hospitals in France the writer did not see a single appliance planned or constructed to prevent distortion of the soft tissues and at the same time to save both hard and soft parts. The principles here involved are to my mind the great secret in the successful treatment of severe jaw cases complicated by a loss of both hard and soft tissue. Inquiry among other members of the unit who had visited the English hospitals in London and elsewhere developed the fact that up to this time there had not been an appliance of the type about to be described in this paper made or applied.

The older or what might be called the chronic cases observed, with loss for instance of symphysis, were found with the remaining fragments of bone in good position, but the soft tissues had retracted well back and were much scarred, leaving a large opening in the front of the face, thus necessitating the turning of a large flap in future plastic restoration. In a majority of such cases where apparently there was a great loss of soft tissue, it had merely been blown open and more or less shredded, but if treated after the method herein described only small flaps were needful in the severe types, and in many instances no flaps were used, thus saving much time in plastic surgery.

There is no desire to make too broad a claim for this appliance, and in the application of the principles of extra-oral tension in facial surgery the writer simply wishes to emphasize the fact that what appears to be a large loss of soft tissue in many cases is really no loss at all, but if such wounds are allowed to repair simply under irrigation there will be a great retraction and real loss of tis-

sue, with a graft necessary; and where there is actual loss of substance this treatment will permit the use of a much smaller graft, thus saving time, trouble, pain, and tissue.

DESCRIPTION OF THE SPLINT.

The splint (Figs. 1 and 2) is composed of cast or swaged caps placed upon all remaining healthy teeth which it is possible to retain. The caps on each side are joined by double lingual and labial bars extending from each set of caps and lapping; these are held in position by twin set-screws. This permits the setting of one side of the splint at a time, which is a great convenience and prevents much trouble. Passing forward from the center of the splint and attached to it by means of a set-screw is a double bar, to the anterior end of which is soldered a metal chin-piece made into the desired shape by the addition of modeling compound or vulcanite rubber. The chin-piece is adjustable and can be removed readily without causing tension on the flap, by sliding it back and away from flap before removal. Attached to the chin-piece but made removable is the extra-facial bar forked on the end, for exerting extra-facial tension on the soft parts. (Figs. 1 and 2.) All bars used in these splints should be of No. 14 gage, as all parts must be exceedingly firm.

APPLICATION OF THE SPLINT.

The application of this splint to a practical case will now be described. The case shown in Figs. 3, 4, 5, 6, and 7 was brought into the hospital about three days after a gunshot wound of the face.

Examination. The patient showed complete loss of bony substance from the second mandibular molar on the left side to the second mandibular molar on the right side, the soft parts being blown open with considerable loss of tissue (possibly an inch); a compound fracture presented through the left angle of the mandible; the anterior fragment on this side, containing the second and third

FIG. 1.

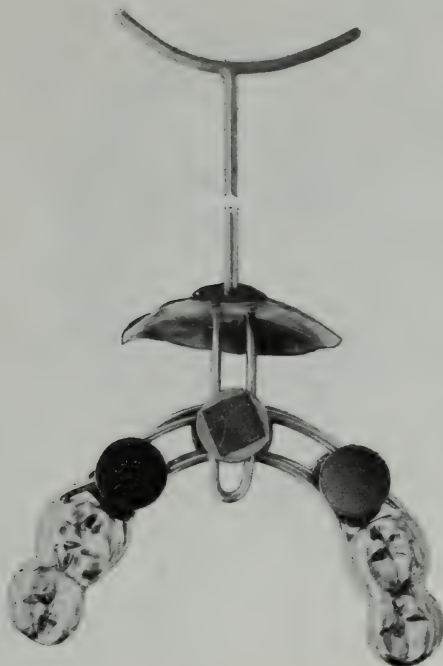
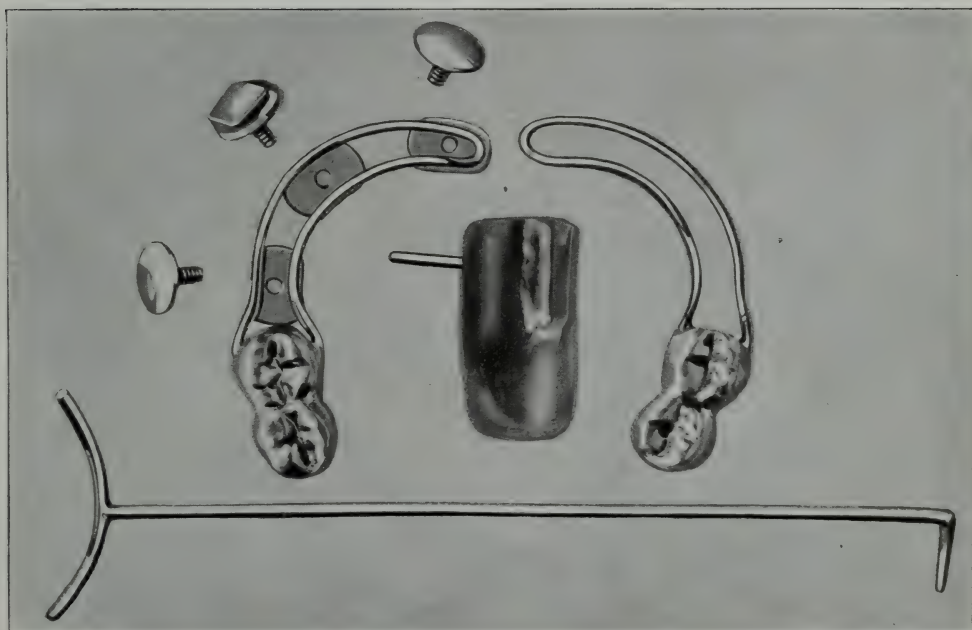


FIG. 2.



FIGS. 1 AND 2: The splint.

FIG. 3.



Case as it presented on entry into hospital. Notice soft tissue about lower lips and beneath chin which would contract and be lost unless put under tension.

FIG. 4.



Lateral view showing facial bar and shoe-hook pads in position, with soft parts under extra-facial tension. Splint in position on lower fragments and locked into occlusion to upper jaw.

molars, was displaced lingually and was lying in a horizontal position with the molars pressing into the base of the tongue. The right fragment being displaced inward and upward, control of the tongue was lost, making it necessary to suture through the tongue to control it. The wound was badly infected, giving off extremely foul odor and pus.

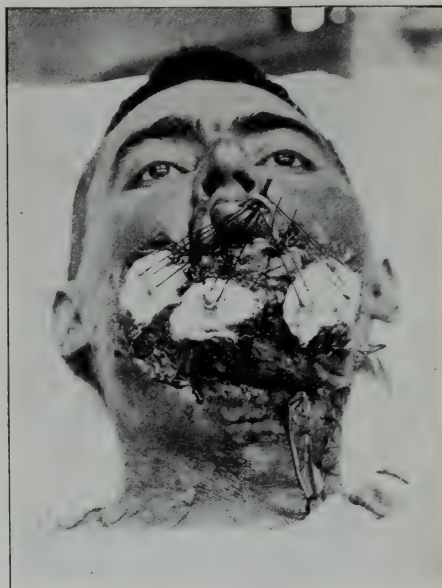
FIG. 5.



Anterior view. Photograph made at the same time as Fig. 4.

The wound was first irrigated and cleaned up as well as possible and later given an irrigation of Dakin's solution every two hours. Wire hooks were placed on the remaining lower molars and corresponding upper molars, and elastic tension exerted by interdental rubber bands, by which method the fragments were brought into position in two days. Impressions were taken and within a week from the time of entry into the hospital the splint was set into position. Shoe-hook pads were then attached to the skin by means of collodion on each side and well back of the wound, as shown in Figs. 4 and 5. Elastics were attached

FIG. 6.



After plastic operation; showing extra-facial tension applied to relieve tension on sutures.

FIG. 7.



Taken about one month after plastic operation. Notice the vermilion border of lower lip.

FIG. 8.



FIG. 9.

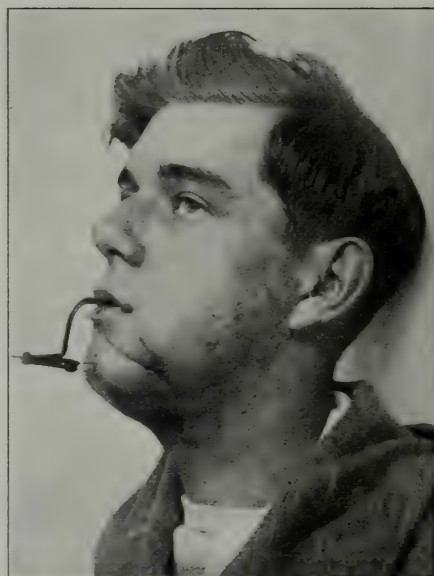


Extra-facial tension used to relieve pressure on pedicle where it passes over supra-orbital ridge.

from these to the end of the extra-facial bar, applying tension to stretch the soft parts and prevent contraction. The elastics were kept in position until the patient was ready for a plastic operation, which was about six weeks from the time of entry.

The result of such treatment was appreciated at the time of the operation, for instead of contraction of the soft tissues with a larger wound, the distance between the wound edges was considerably lessened; this was exactly the reverse of the condition of all other cases that had been noted prior to this time. Immediately following the plastic operation the extra-facial bar was used to relieve the tension on the sutures and pedicle, as seen in Fig. 6. Unfortunately, this case had to be evacuated before the patient was ready for a bone-graft, but the result as far as the treatment was carried was good, and there could be no question of the value of this type of appliance in such cases. Modifications of this splint were later used on a number of like cases with good results.

FIG. 10.



Extra-facial tension used to draw bone fragment forward.

The following are some of the purposes for which the appliance was used:

(1) Prevention of contraction and distortion of soft parts. (Figs. 4 and 5.)

(2) Relief of tension from sutures after plastic operations. (Fig. 6.) It is applicable especially in restoration of chin, lip, nose, cheek, etc.

(3) Relief of tension from pedicle in flaps turned down from the forehead due to pressure on the supra-orbital ridge,

which will sometimes occur, and thus to prevent obstruction to vascularity, with sloughing and loss of flap. (Figs. 8 and 9).

(4) It was also used to lead bone fragments of the mandible into new anterior positions. (Fig. 10.) In fact, this type of appliance may be applied when and wherever extra-facial pull or tension will facilitate the operation desired.

201 W. MADISON ST.

Light and Lighting for Dentists.

By H. FREEMAN BARNES.

EDISON LAMP WORKS OF GENERAL ELECTRIC COMPANY, HARRISON, N. J.

THERE is as much diversity of opinion among dentists regarding the proper light for mouth illumination as there is among the anointed regarding the most agreeable manner of entering the pearly gates. All agree it is desirable and necessary, but each differs as to the method to be employed.

The ideal light would be one that, no matter where the dentist stood nor in what position he placed his instrument or mirror, a shadow would not be cast. The ideal light would also reach every nook and corner of the mouth—even the upper third molar teeth—and would make root-canal work simplicity itself. Further, it would be one that never got out of order, required no attention beyond, perhaps, the pushing of a button, was never in the way—and the cost of which could be paid for out of the profit on one amalgam filling.

Theoretically and altruistically, it would be possible to design such a system. But, unfortunately, practical and commercial ideas so discolor the picture that the ideal harmonizes as well as a pure white tooth among a set of blue-gray shades.

Present practice divides itself into two classes—those who prefer an approximation to daylight, *i.e.* flooding the room with light, and those who use a small concentrated beam. The tendency points toward the use of high intensity general illumination—that is, of overhead units, either fixed or adjustable—supplemented, when extremely difficult work necessitates, by a spot or mouth lamp.

OVERHEAD UNITS.

In order to minimize shadows, the light must come from more than one direction, and this necessitates either the using of more than one light source, or a unit with a large reflecting surface. The semi-indirect and totally indirect types of fixtures, which direct all or a large part of the light to the ceiling, come under the latter heading. (Fig. 1.)

The overhead units must be properly placed, otherwise much of the light may not be utilized. As the dentist spends most of his time at the patient's right, a single unit, if equipped with a reflecting dome, should be placed to the front and slightly to the left, a position

directly over the front of the left arm of the chair. On an adjustable fixture the swing of the supporting arm should be regulated for this position. The single unit, with reflecting dome, such as sold by supply houses, is satisfactory

the fixture to suit conditions or fancy, and the producing of a shadowless illumination, the greatest advantage lies in the ease of installation. As commonly put up, the swinging arm is fastened to the window casing, and as

FIG. 1.



Night view, room 10 x 15 ft., three 200-watt Mazda C 2 lamps in 14-in. medium density semi-indirect bowls hung $7\frac{1}{2}$ ft. high. Walls blue-gray, ceiling white. Note absence of glare.

and fills a great need. It can be furnished either plain or decorative. (Figs. 2 and 3.)

The popular four-bulb adjustable fixture has come into favor of late, and is regarded by many users as the solution of the lighting problem. While many claims are made, such as having the light where it is wanted, being able to adjust

the chair nearly always faces a window, there is usually no difficulty in securing a correct position. (Fig. 4.)

Semi-indirect or totally indirect lighting is preferred by many because of the even distribution of light and the absence of glare. When once properly installed, it requires no further adjustment or attention. An adjustable instrument

is bound to require adjusting. Where all that is needed is a snap of the switch, the dentist can generally save much valuable time—and dentists, as a rule, at least good dentists, are not blessed with many idle hours.

In a small office where only one semi-

total cost of one 500-watt over three or four 75-watt bulbs would be less than 40 to 50 cents per week, and the amount of light would be increased 150 to 200 per cent.

Use plenty of light. It is one of the most inexpensive of necessities.

FIG. 2.



Night view, room 10 x 10 ft. Single unit with reflecting dome on adjustable arm, using one 300-watt Mazda C 2 bulb. Walls buff, ceiling white.

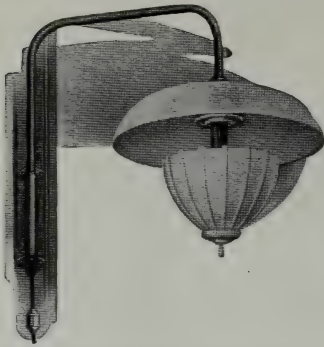
indirect fixture is used, a 500-watt blue bulb (Mazda C 2) lamp will give excellent results. Of course, a 500-watt lamp in size is larger than a miniature flash-light bulb, and the uninitiated feel that perhaps such a bulb is all right for electricians, but not for dentists. Some of our present modest buildings, however, seemed like skyscrapers when they were first built. Even if the dentist needed light three hours per day, the

In a larger office (see Fig. 1) three medium density opal glass semi-indirect bowls could be used to advantage; 200-watt lamps may be installed. The rear unit should be slightly to the front of the head-rest. Such a scheme will produce an illumination that is as near uniform, glareless, and shadowless as is practical to obtain.

Daylight is diffuse, because it comes from many directions; so with the semi-

indirect light, the entire ceiling reflects light at numerous angles, many rays

FIG. 3.



Semi-indirect unit with reflecting dome, 300-watt Mazda C 2 lamp used. Differs from unit in Fig. 2 in that it is not in one piece.

being again reflected from the walls. Cross rays tend to eliminate shadows.

FIG. 4.



Night view, room 8 x 9 ft. Four-bulb type unit with holophane globes using four 60-watt Mazda lamps. Walls gray, ceiling white.

It is impossible to produce shadowless illumination where the light comes from one direction only.

The blue bulb nitrogen (Mazda C 2)

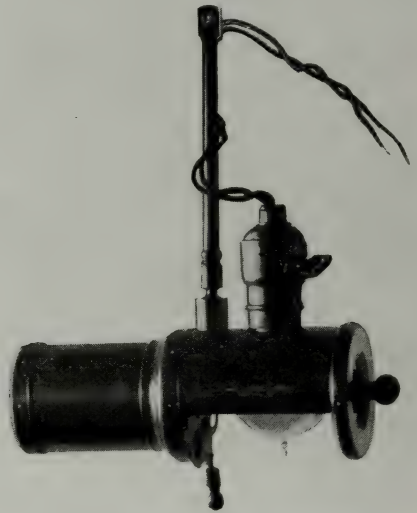
lamp is widely used at present in all of these units. It gives a light which is an approximation to daylight and under which teeth more nearly assume their natural color. The blue bulb is not recommended for the most accurate shade-matching.

Especially should gas-filled (Mazda C) lamps, unless placed very high up, always be inclosed in a diffusing globe—never exposed to the eye. The direct light rays from a highly concentrated filament are too brilliant to be safely viewed with comfort.

SPOT-LAMPS.

The simplest form of a concentrated beam is found in the ordinary low-

FIG. 5.

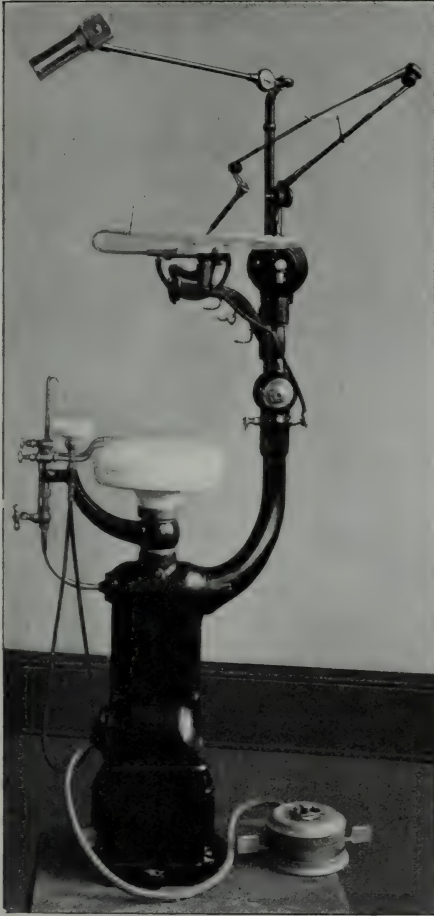


Lens type spotlight on adjustable arm, 40-watt globular Mazda lamp.

wattage lamp with a half shade reflector and either a flexible or adjustable arm. It is open to objection, since, as commonly used, much of the light is thrown in the patient's eyes, and in the case of flexible arms, the arm with use may increase in flexibility beyond the point of usefulness. For convenience and simplicity, however, if the reflector is not too large, such a light may be used to advantage.

The lens type spotlight, while formerly filling a need, is becoming, with the advent of the high power overhead fixtures, a light for special use only. It not only

FIG. 6.



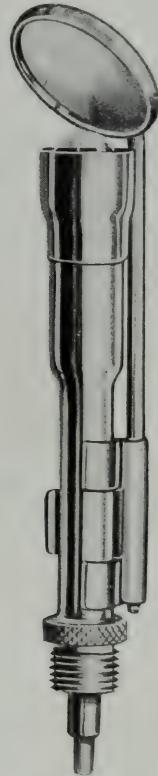
A small, compact type of concentrated spotlight on an adjustable arm. When not in use the arm may be quickly swung back out of the way. A 125-volt 10-watt lamp is used.

requires an initial adjustment, but has to be constantly readjusted with each change in position of the patient's mouth. If the light is strong enough, however, the spot may be used for root-canal work and even for trans-illumination in the detection of dead teeth. (See Figs. 5 and 6.)

Another spotlight that finds special use is the headband type. When used in the office it can be run directly from the lighting circuit, and if necessary for outside work a battery type can be secured.

With the use of any spotlight, sufficient general illumination should be provided—preferably from an overhead unit—to enable the operator to readily see any instrument on his stand or cabinet. In a poorly lighted room the contrast between a brilliantly illuminated area and the dark surroundings is a source of confusion to the eye.

FIG. 7.



Illuminated mouth mirror, such as used with transformer switchboard.

MOUTH LAMPS.

The illuminated mouth mirror (Fig. 7) is so universally known that a description is unnecessary. It may be run from either

battery, resistance plug on the house circuit, or board transformer. The resistance plug, owing to heating, in many cases has been found unsatisfactory. The connecting wire on some types is a continual source of trouble. A few makers use a special bulb which is expensive to replace. The switchboard electrical equipment includes two light units, one an illuminated mouth mirror, and the other an antrum or examination lamp.

One paramount point in selecting a mouth lamp is the assurance of sanitation. The lamp must be easily sterilized. Another item is the matter of heating the mouth. Certain lamps when bright enough to give sufficient light give so much heat that the patient receives the impression that perhaps the lamp was inserted to dry up the saliva.

A few dentists have made use of the ordinary fountain-pen dry-cell flashlight, not wishing to be bothered with connecting cords. Such an arrangement may require the use of three hands—something the average dentist does not possess.

WALL FINISH.

A word or two in regard to wall finish in the operating room. Sanitary reasons demand a cleanable surface. A chair in white enamel, a white tile floor, walls painted a glossy white, and a white ceiling would give the best and most approved conditions for a strictly sanitary room.

The most serious objection to a room finished entirely in white is the psychological effect on the patient. In the operating room of a hospital the patient is usually unconscious and the wall finish to him is of little consequence. But in a dentist's chair the patient is, as a rule, very much alive, and a room of dazzling white brings up mental pictures that are not conducive to comfortable relaxation. A glossy white finish also produces an intense strain on the dentist's eyes. A dark skeleton paneling with a buff or grayish wall finish, mat surface, either paper or paint, is attractive and gives good reflection without

eyestrain. The ceiling and upper walls should be white.

LABORATORY.

In the laboratory, lathe polishing, gold and plaster work, soldering and plate-finishing, require a high intensity of illumination. For the lathe use a 75-watt blue bulb nitrogen (Mazda C 2) lamp in a steel bowl-shaped reflector hung 4 to 5 ft. above and a little to the front of the motor. If shelves or cabinets extend higher than the hanging height of the lamp, use a prismatic or opal glass shade instead of steel. If (as in many private laboratories, where the room is narrow and long with a bench running the length of one side) the lathe is placed at one end, a second unit should be hung near the other end of the bench. The walls might be finished in buff or tan with a medium or dark dado, and the ceiling white.

OFFICE.

When the office is separate, modern practice suggests the use of a semi-indirect fixture. The old idea that a desk lamp is indispensable has been disproven. While a valuable aid, the lamp often does more harm than good, since, as commonly used, it shines directly into the eyes, producing intense discomfort. When the desk is in the waiting-room, a reading lamp may be economically advantageous.

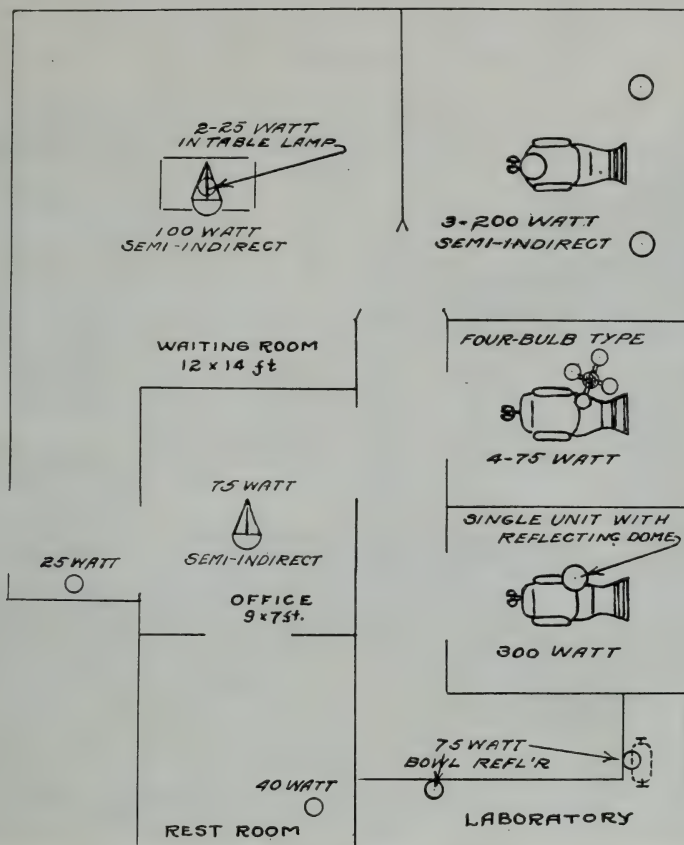
WAITING-ROOM.

The waiting-room is for many patients as much a chamber of terrors, mentally, as the operating room may be physically. Soft tones should predominate. A semi- or totally indirect decorative fixture is most harmonious, and should give enough light to enable patients who so desire, to occupy their minds in thumbing over magazines. One unit, hung in the center of the room, supplemented, perhaps, by a table lamp, will be sufficient. For a room of 200 sq. ft. (15 x 13 ft.) use a 100-watt nitrogen (Mazda C) lamp. Many dentists who have installed this form of equipment keep the

table lamp always lighted as a decorative feature, only using the overhead fixture when conditions necessitate. (Fig. 9.)

Lighting equipment is like almost anything else; to work at highest efficiency, it must be kept clean. We cannot, as a

FIG. 8.



Plan of dental suite. All lighting units in laboratory and operating rooms are equipped with blue bulb (Mazda C 2) lamps. All lamps with exception of 25- and 40-watt are gas-filled (Mazda C).

TABLE:

Lighting for waiting-rooms.

Room.	Sq. ft.	Wattage.
10 x 10 ft.	100	60
12 x 12 "	144	75
15 x 15 "	225	100
15 x 20 "	300	150
20 x 20 "	400	2 @ 100

The table shows approximate size lamps for different size waiting-rooms. Where walls and trimmings are dark, use next higher wattage.

rule, wash our hands on Monday and expect them to be clean for a week: neither should we allow our reflectors and bulbs to go uncleaned indefinitely. Semi- and totally indirect fixtures, especially, require frequent cleaning. Never allow a unit to go uncleaned for more than three weeks. Even a slight layer of dust makes an appreciable difference.

The majority of light-users are not aware of the real advantages in using plenty of light. One dentist, whose

lighting equipment consisted of a 25-watt bulb in a tin reflector, when asked what he did when it became necessary to work on back teeth while the light was poor, answered, "Oh, I can work without it just as well"—which would seem

It is oftentimes very difficult for the dentist who does not do night work to realize the necessity for adequate lighting equipment. Present practice in *all* modern installations for *all* kinds of work, however, shows a marked tendency

FIG. 9.



Night view of waiting-room 17 x 22 ft.: 14-in. alabaster semi-indirect bowl using one 150-watt Mazda C lamp. Two 25-watt bulbs in table lamp. Walls buff, ceiling white.

to prove that all this talk about good lighting is nonsense, and that the ideal operating room would be one in which darkness reigned supreme!

In industry recently, during the feverishly augmented war work, the necessity for plenty of light was realized. Many manufacturers have found that an increase of 100 per cent. in their lighting—meaning an expense of less than 1 per cent. of the total manufacturing cost—has given an increase of from 15 to 25 per cent. in the output of material.

to install efficient lighting equipment regardless of how seldom it may be required.

The relative value of light cannot be measured alone by increased efficiency on a dollars-and-cents basis. Adequate artificial lighting is a modern-day necessity.*

* The author wishes to thank the various dental supply houses, the many dentists who were visited, and especially Dr. G. W. Lewis of Brooklyn, N. Y.

A Biologic Aspect of Periodontia.

By PAUL R. STILLMAN, D.D.S., New York, N. Y.

INSTRUCTOR, DEPARTMENT OF PERIODONTOLOGY, COLUMBIA UNIVERSITY.

(Read before the Connecticut State Dental Association, at its annual meeting in Hartford, April 15, 1919.)

THE purpose of this paper is to renew interest in a problem of dental practice which is already familiar to you all. An endeavor is made to emphasize and elaborate one simple yet essential clinical hypothesis. It is believed that its practice is not new to some periodontists, judging from many of their "finished cases" which it has been my pleasure to examine. It is also believed that this hypothesis has never before been presented to the profession.

Biology is the science of life and of living things. The observation of its laws is an important factor in the success or failure of every case which the periodontist is called upon to treat. Life is a continuous contest between the organism and micro-organisms. The eventual death of the organism is proof that the micro-organism is in every case the victor. In treatment the clinician is dependent upon the forces of life which are set in action as the result of his operation, even more perhaps than upon the particular application of technical skill which is an accomplishment of his hands. It is entirely because the patient has life and because that life will react to treatment that we sustain our interest. A cadaver may be treated as skilfully as a living person, but where would be the incentive?

It is my purpose to refer here but casually, or only as necessity demands, to the pathology of dental periclasia. Pathology at its best is a pessimistic science. Pathologists accentuate the morbid, revel in results of disease, and look upon death as the inevitable reason for life. To the pathologist all life is

woe and leads directly to the grave. There is as much difference in practice between a dental pathologist and a periodontist as there is between an undertaker and an osteopath. While it is essential that we understand and keep abreast of the work which is being done by the dental pathologists, we should not let this morbid science stand between our clinical skill and ultimate success. The writings of the great dental pathologists, Miller, Black, and Talbot, never exhibited any optimism upon the subject of the management of cases. The whole problem of treatment hangs upon the biologic, not the pathologic.

To the clinician, in the management of cases and particularly in diagnosis, some of the questions which are of greatest import are—

How much of the regenerative activity still exists in the remaining pericementum?

Can its constructive activity be re-awakened?

Can the factors or forces which have been responsible in producing or causing the condition be eliminated?

Let us for the nonce stand upon the extreme right instead of upon the extreme left. Let us remove our backs from the sun and our own shadows from the canvas, so that unobstructed light may fall without a shadow full upon the picture.

All bioplasm is continuously under the influence of two distinct forces, one which is constructive, leading always in the direction of the normal, the other regressive. These two forces are continually at war. From the single living

protoplast up to the most complex organism with its complicated structures, this contest results in a succession of changes which is commonly called cell activity. The constructive activity results in development of the organism and a continuity of structures. New living structures are being stimulated into form by the function of the part, while matured cells which have withstood attack are being replaced. Living cells need nutrition to endure. Nutrition is maintained by function. When function is reduced in some degree, changes occur which result in atrophic degeneration. The biologic law which seems to govern cell function seems likewise to govern the grouped cells of an entire organism. Thus we observe that the cementum cells are differentiated as cementoblasts and cementoclasts, while morphologically there appears to be no microscopic distinction. The honey-bee will serve as a biologic example of a dual or multiple function in a single specimen variety. One group of bees will function as honey-gatherers, another group as comb-makers, etc. Instances of this kind occur throughout the whole biologic field of study.

When tissue is injured, provided the structural identity is unchanged, there begins a process which is called inflammation. Like the cementum cells and the others which both tear down and carry away, as well as reconstruct and build the cementum, so inflammation is at once a process which results in tissue atrophy while at the same time it is fighting to re-establish normal conditions.

It has been held by some (myself included) that the processes which destroy the periodontal tissues are not essentially of an inflammatory character. But after reading Adami's classic upon this subject ("Inflammation," by J. George Adami, Macmillan & Co.) I stand converted, and now believe that dental periclasia is essentially an inflammatory process from its inception in the subgingival space to the possible exfoliation of the uncared-for tooth. To the four cardinal symptoms of inflammation—heat, redness, swelling, and pain—Adami adds a

fifth, viz, "disturbance of function brought about by departure from the normal condition of the region." While under favorable conditions, where the region injured is dense or less vascular or where the injury is less severe, "one or all of these symptoms may seem wanting, nevertheless a minute examination of the tissues will show the same succession of changes which possess all of the four cardinal symptoms."

DIAGNOSIS OF PERIODONTOCLASIA.

To the operator in dental periclasia a knowledge of the intimate histology and pathology of the tissues which are to be treated is assuredly of importance in arriving at a correct diagnosis. And without a full and complete diagnosis of each case which has been made in advance of its treatment, a diagnosis which will give the operator a clear and definite objective together with the reasons why he should proceed in the manner laid down as correct and true, there will be no science in the result, even if by chance a cure should be effected. All treatment must be backed by a careful study of causes. It is a generally accepted axiom that the successful treatment of disease depends upon the removal of its cause. In dental periclasia the initial attack is an invasion of micro-organisms into the border of the subgingival crevice. But, to have an invasion, tissue must be prepared for the invasion by some attack upon, or an injury to, the cells of that tissue. The preparation for an attack may arise from many causes; it may be mechanical, chemical, bacterial, or simply a disturbance of function, as when through disuse the atrophic changes cease to be reactive and the cell resistance becomes lowered (as in disuse atrophy) through sheer inanition. There are also observed irritants to the gingival border which appear to be so mild that little or no immediate cell destruction results from their action. Nevertheless, in a very great majority of gingivitis cases there is macroscopic evidence that the dual processes degeneration and destruction are co-active.

For this interval we shall change our viewpoint, as I have already stated. We shall study the biologic problem as it may be applied to treatment in dental periclasia. The farmer, the gardener, the forester, the surgeon, *et al.*, and particularly the periodontist, each recognizes certain changes which occur and which follow inevitably every act he performs in the treatment of the particular kinds of structure which he attempts to cultivate. These persons, whose vocations are so varied, all operate under the same biologic laws which govern all cell action. Each in his separate field has observed that if certain things are done or happen under the same conditions and combination of conditions, there inevitably follow certain changes in the cells of the organism. Thus the farmer knows that he must plow his soil and prepare it for the living seed which he proposes to sow; that the seed must have food, water, nitrogen, etc., to be able to develop and to grow. He takes from his experience and knowledge that which he has learned from repeated observation and practice, and applies it to the object of his care. This knowledge comes from an observance of the natural or biologic law as it has been revealed to him from his education and experience. The more nearly the farmer is able to interpret the natural desires or impulses of his corn-field, the greater will become his reputation as a successful farmer, and the greater his yield.

Let us illustrate one point by the application of an analogy. Let us pay a visit to the gardener, for instance, the professional highly trained gardener, of whom the Scotch furnishes perhaps the best example. Here is a true biogenous clinician who is practicing a profession; his whole life is devoted to the propagation and protection of growing things. We are, let us assume, a party of four—you, your son, the gardener, and myself. With evident pride and pleasure the gardener displays the products of his laboratory. The boy and I observe that consciously the gardener is continually using an implement, digging and loosening the earth about the roots of his

plants; picking off branches and buds; pulling up whole plants and casting them aside. It is my observation that each act of this description is performed with a definite intention as a part of his plan or scheme for the development of certain organisms. Not so the boy. Being intellectually immature he fails to grasp the true significance of the gardener's acts, and observes to himself, "Sure, I could be a gardener! I can do that as well as the gardener. I can hoe; I can break leaves and buds; I can pull up plants; I could be a gardener—sure!" I trust it is not necessary to carry the similitude farther to illustrate my point, nor to finish my story by telling you that the results of the boy's operations in gardening, when put into practice, were not the same as that of the gardener whom he thought to imitate. Yet the boy did ostensibly the same things. But for fear you may miss the application, I will say the biologic problem is identical in principle whether it is applied to the growth of plants or to the investing structures of the teeth.

Living things are all composed of cells. All pathology is cell pathology; all histology is cell histology; all biology is cell biology, and all cell life is governed by the same fundamental laws.

Who among us has not observed, I might say experienced, the same disappointment as the boy, when we failed to accomplish results similar to those of some expert clinician? An observer at a pyorrhea clinic sees an operator planning a root-surface and understands that the intention in the operation is the thorough removal of all septic debris. He inquires as to the type of instruments being used and where they may be procured, notes the manner of their use; takes heart and encouragement, satisfied that once he has had an opportunity to perfect his technique, he will achieve success in treatment. But does he not miss the real significance and application for the necessity of such treatment? There are conditions where the planing or curetment of a root is contra-indicated. There are certain conditions where the combination of factors are as certainly

set against a successful operative result as when the two red semaphore lights are set against a railway engineer when his train approaches a closed block of track. Every operative act should be an intelligent service. It should never be a stupid attack upon an organism. That root surgery could at any time or under any conditions be the wrong thing in the treatment of one periclasial tooth and be indicated by the necessities in another, may appear to some as an absurd statement.

To keep the biologic idea clearly before us, we shall return to the garden for our analogy and later take up its application to the tooth. We shall assume that it has been raining for a week; the soil in the garden is not simply wet, it has become soft mud; true, there are weeds which should have been removed ten days ago. On the morning of the seventh day of heavy rains, the "boy" says, "I shall now go out and hoe, because the garden needs hoeing." We may all admit the contention that there is necessity for hoeing, but we also know that hoeing in a garden at this time and under the conditions of slop and mud could be reasonably said to be contra-indicated. The soil must first dry out a bit. To work wet mud soil with a tool would actually retard and upset the development of plant organisms.

In the whole biologic field the etiological factors leading to retrograde changes always occur in groups. Dr. John Oppie McCall of Buffalo, New York, was the first to call attention to and apply this fact in periodontia. This postulate of McCall's, stated from memory, runs like this:

The etiological factors which are responsible for the various manifestations in periodontoclasia are six in all. The first four are primary and the fifth and sixth secondary, or non-inaugurating. Of these six factors any two or more may be present and contribute to the cause and development of the condition, but never any one factor singly.

Now to return to our muddy garden. What are its necessities? What are the diagnostic findings? The first fact established is that it is too wet; this will

be corrected naturally when the rain stops—in other words, it is a factor which is not within the power of the operator to remedy. Second, the garden needs sunlight, not only to take up the excessive moisture and to dry out the soil so that it may be "worked," but it also needs the sunlight as a food element. Third, it needs food liberation, viz, air, moisture, nitrogen, and certain nutritive mineral salts of soil. So much for the diagnosis.

We shall next consider treatment; operation should be postponed until the soil dries out. All weeds should be removed, for weeds take up the food elements which are needed by the plant itself: the soil about the roots must be kept mellow and light so that air may enter. It is surely unnecessary to go farther into this subject of practical horticulture in order to show the close analogy of this to periodontal diagnosis.

We shall take for our dental example a typical "pyorrhea," one of those cases where there could be no dissension by one who perhaps had never used nor understood the meaning of the newer and more generic term "suppurative periodontoclasia."

Clinical examination of this tooth reveals a right upper cuspid which is more than a little loose, yet not so loose that it may be rotated in the alveolus by a twisting motion of the thumb and finger. Trans-illumination and the electric current tests show conclusively a vital pulp. The radiograph shows a marked destruction of alveolar process which extends into the apical third of the length of the tooth and to within a little less than 2 mm. of the apex. This rarefaction appears over the region of the distal alveolar wall. Probe examination coincides with the radiographic findings as to location and depth of the pocket. Passing a curet over the root surface of the pocket reveals hard deposits which extend only to one-half of its depth. A small quantity of whitish yellow pus is exuded by milking pressure, but the flow is not copious. There seem to be no acute symptoms reflected to the overlying vascular structures of the pocket. An ex-

amination of the occlusion shows a mutilated class I malocclusion. The contact relation of the occlusion of this tooth shows a marked traumatic occlusion with its opponent in the lower jaw.

PROGNOSIS AND INDICATIONS FOR TREATMENT.

The two coexisting primary factors which are within the power of a periodontist to correct and eradicate are the traumatic occlusion and the obviously septic root surface of the pocket. The other factors necessary to restore this tooth to a state of health are biologic and outside of the control of the operator. The excessive impact of the lower tooth causes the displacement of the tooth which we have under discussion, which is literally driven outside of its normal position each time the jaws are brought into occlusion. We have then (1) an infected tooth-joint, with (2) motility of the tooth. This motility is the block signal already mentioned, which is set against every effort of constructive cell action or healing.

This motility is analogous to that of a broken tibia, inasmuch as there can be no regenerative effort upon the part of the organism until physiologic rest has been secured. A broken tibia demands fixation by the application of a splint, and physiologic rest for bone repair. The tooth demands relief from traumatic occlusion and physiologic rest from pericemental shock, which has by its almost continuous action caused the cell death of a large portion of the immediate investing structures, leaving the remaining vital or semi-vital cells in a state of lowered resistance. The indications for operating surgically should always be preceded by a valuation as to the etiological importance of the several necessities of the organism.

The relative biologic importance of the two factors which complicate this case, and which are the only two factors within the remediable scope of surgical interference, should not be difficult to determine. It is not that one factor is not important, it is the sequence of their significance—their relative importance.

It is with such a combination of clinical findings as are here made, that root curettage would be contra-indicated as the preliminary attack. It would be contra-indicated for the same biological reason that the "working of the soil" of a too wet garden would retard development of plants; it would be contra-indicated for the same reason that a cotton-and-bandage dressing would be contra-indicated instead of a proper fixed splint in the case of the broken tibia. To be sure, we may also pull up a few weeds, and make an effort to drain the wet soil. That is to say, we may remove septic debris and concretions from around the neck of the tooth in many cases without increasing the strain on the periodontal tissues, and we may prescribe a suitable mouthwash and rational mouth toilet in order to reduce the congestion in these structures.

A case which has suffered from prolonged traumatic occlusion needs, above all things else, physiologic rest. This may usually be accomplished by grinding the affected tooth. The method of treatment of traumatic occlusion is too big a subject to be included here. (The technique of treating traumatic occlusion was described and published in the *Journal of the N. D. A.* for July 1916.)

It has been previously stated here that "when function was reduced to a degree, degenerative atrophic changes occur." Normal function is the physiologic office which nature gives to structures for the continuance of life within the vital organism. The principal function of our teeth is mastication, and this may only be maintained by a normal relation of the occlusion of jaw with jaw. Traumatic occlusion has been mentioned as a pernicious relation leading to periodontal infection. Its relation to occlusion could be correctly stated as occlusion+, plus or super-occlusion. Normal occlusion where there is no interference with function then could be represented by the sign 0, or zero, as has been done in the thermometer, the sign being one that has been fixed at an arbitrary place upon the glass. Under the sign of occlusion — (minus) then would fall all those teeth

which were not in function and therefore do not have the health-giving benefits of an innocuous occlusal relation. Dental periclasia which has at the same time a contributing disuse atrophy could then be placed under the minus sign (-). If the line of normal be represented by the sign 0, or zero, super- or traumatic occlusion would range in degrees above the line, and all disuse cases would fall below the line, under the minus sign. This latter class is by far the most difficult type which the periodontist is called upon to treat, for the reason that in all of these cases the restoration of function is a difficult problem. The subject of dental disuse atrophy with its accompanying infections is of sufficient size and importance to demand a separate paper.

Successful treatment of dental periclasia is being withheld from quite a large group of our profession by the fact that they know so much about the subject which is not true. By far the larger number of those who are happy in periodontic practice and with the results of their clinical efforts never attempt to write of their successes nor to go into print. They say to those of us who do, "Why do you waste the midnight oil? You know you have nothing new to tell the profession; why waste your time?" We answer, "Truth can afford to be reiterated and repeated forever, if necessary, for truth is ever new." But there is a constant attack upon the established methods of organized periodontia by a certain type of pseudo-scientific charlatans and their following. These doubters, these exploiters and dupes of exploiters, chasers of some cure-all, some home treatment, or some "easy method," are always to be found upon the side opposed to right. It is in a spirit of op-

position to them that a few men have taken to the platform to combat these false prophets. The members of the American Academy of Periodontology hold collectively some truths which are fundamental. Its members are in accord upon this fact, viz, that there never has been and there never can be a successful cure-all in any drug or combination of drugs; any serum, or a single product of the bacteriological or chemical laboratory; there will never be invented any device, apparatus or machine which will satisfy all requirements in the treatment of dental periclasia; and the reason is that every case of dental periclasia presents in itself a somewhat different and distinct biologic problem.

Between the fad methods and systems of treatment which have been already exploited and the management of cases in the offices and clinics of the ethical specialists in periodontia there is hardly an essential point of similarity, while the dissimilarities are so great that to couple or compare one with the other in a discussion of the subject would disclose scientific ignorance thereof so nearly complete as to be almost admirable. As a matter of fact there is nothing mysterious in the standardized and accepted management of cases. The sequence from cause to effect in correct diagnosis and treatment is visible and invariable, and that is all that can be said of any other phenomenon in biology. The whole secret of a broad success lies in diagnosis. The joy in periodontia lies in *doing* those *acts* which are indicated; the satisfaction, in knowing that one's pre-operative study and diagnosis have been proved correct by cases recovering their health after treatment.

52 VANDERBILT AVE.

Dental Legislation for the Elimination of Malpractice in Dentistry.

By H. J. OLDSTEIN, D.D.S., Scranton, Pa.

IN the March issue of the DENTAL COSMOS, Dr. Albert Nahas of Alexandria, Egypt, in his article, "A Plea on Behalf of American Dentistry," asks, "Does American dentistry need an advocate?" In his article, Dr. Nahas attempts to defend American dentistry on the plea that English dentistry is not any better than American or Australian. He says further that the condition is not to be blamed on the "high class of American dentistry," but on American dentistry as practiced in England.

Had Dr. Nahas known American dentistry as it is being practiced by a certain class of dentists all over the United States, as we dental practitioners know it; could he but see how our advertising dental parlors, or as they call themselves, "painless dentists," carry on their practice, which is a disgrace and detriment to our profession, he would surely change his views, and confess that our American dentistry is in need of a thousand advocates and defenders, in order to save our patients from the clutches of this class of practitioners, who fatten on their ignorance, and thus to save also the honor of our profession from censure and condemnation.

Dr. Nahas cites a case in Paris, where a dentist was brought before court for having a sign on his door "Chⁿ Dentiste," illegally, and the dentist pleaded for mercy from the judge, claiming that "Chⁿ Dentiste" can stand also for Charlatan Dentiste. How many cases do we in this country bring to court for illegal practice, malpractice, and defrauding innocent patients? Heaven knows we have them by the scores in every city and in

every state—legal as well as illegal charlatans, with showcases in front of their entrances and pages of advertising in the daily papers, proclaiming themselves as the only reliable dentists!

A VISIT TO CHARLATAN "PARLORS."

I once went into one of these offices in order to convince myself of their mode of practice. When my turn came to be waited on, I was called into a cage where the contractor examines patients' mouths. After being asked numerous questions, in order, I suppose, to find out how large my bank account was, I was on the verge of getting a bloody mouth mirror placed in my mouth for the examination. I of course refused to be treated thus, and the contractor called to the man in the next cage to hand him a mouth mirror. After two minutes of probing and examination, I was told that I was in need of four gold caps and eight fillings, some gold and some silver, involving an expenditure of thirty dollars. I could have all this done the same day provided I paid in advance, as the day was bargain day; some other day it would cost more. To me it was really a great bargain indeed—considering that my mouth was in no need of any dental care at all! Such is their mode of practice, and thus they fleece the innocent public. They are the wise business men, and they ride around in expensive machines, live in magnificent mansions, and enjoy all the worldly goods, while the ethical man—the honest, conscientious man—is unable to make ends meet. It is all very well to sit at our society meetings, or at our conven-

tions, and listen to lectures as to how many hours we shall devote to the filling of root-canals, or what kind of words to use in our professional conversations, while the dentist around the corner with the electric sign and colored porter at the door gathers in the coin and never even dreams of filling a root-canal at all, while at the same time supplying numberless operations to the surgeons and many more to the insane asylums and the undertakers.

DR. HUNTER'S CHARGES.

When Dr. Hunter of London came out openly years ago with his protests and censure on dental practice, he blamed all of us, and not a certain class only, for the conditions existing. I have never read an article in our magazines nor have I ever heard a single protest against this class of dentists. Solomon's wise saying, "Let another man's mouth praise thee, and not thine own," can well be applied to Dr. Nahas' defense of American dentistry. More than once has my blood boiled with shame to see poor innocent patients having in their mouths filthy bridges of eight or ten teeth attached to two of their own abscessed teeth and over ulcerated abscessed roots, with pus oozing out from them. Or to see plates fitted in the mouths of patients over unextracted, ulcerated, and broken-down roots—in many cases plates and bridges made the same day after extraction, "while you wait." Necrosis, gingivitis, pyorrhea, alveolar abscess, lacerated gums, and all other oral infections common in the human mouth are passed by without any attention whatsoever. Is it any wonder, then, that many times during my twenty-two years of practice I have wished I had never been a member of the dental profession. I admired Dr. Hunter's courage of censure, and I am happy to say that most of the ethical practitioners have changed their former mode of practice and are doing away in most cases with stationary bridge work, and are paying more careful attention to oral infections. But not so the advertising

dentists; they more than ever persist in their nefarious practices.

THE DUTY OF THE HOUR.

The Allies are now devoting many months to forming the league of nations, in order to curb the Hun from further warfare and eradicate militarism in the future, so as to save the European nations from such wantonly destructive attacks as we have witnessed. We American dentists likewise have a terrible enemy in our midst; nay, more, we have a cancer—an infection that is undermining the name and the honor of our profession, bringing it to ridicule and disrepute. We need a good active surgeon to cut out this pernicious growth from our midst in order to save the health, the lives and happiness, of our innocent patients and save them from premature graves; or, before long, we ourselves will be called before the tribunal of public opinion and be condemned by the suffering and defrauded public. For, as Dr. Hunter blamed us all for others' misdeeds, so will the public blame us all for the misdeeds of a certain class of practitioners. We must first purge ourselves from these charlatans in our midst that undermine our good name and the honor of the profession, before we have the right to praise and glorify ourselves because the Government has recognized our abilities and is giving us titles and honors equally with the medical profession in the line of military duty.

Therefore I call on all dental practitioners, professors and teachers in our dental colleges, officers of our state and National dental societies, to awaken from their slumber and indifference and get together to devise ways and means in order to eradicate charlatanism from our midst. We need strict laws passed by our legislatures and National Congress to be placed on our statute-books and strictly enforced, to curb the existing malpractitioners, clean them out root and all, and, like the charlatan of Paris, make them plead for mercy in the courts. Let them either cease their pernicious activi-

ties and practice legal, ethical dentistry, or close up their advertising parlors. Only then will the name of dentist be an honor to us, and our profession a blessing to our patients instead of a detriment.

Then and only then shall we be justified in praising ourselves and glorying in the good deeds that we accomplish for our fellow men.

421 LACKAWANNA AVE.

Seventeenth Century Dental Instruments.

By P. C. TRELEAVEN, D.D.S., Lansing, Mich.

THESE instruments were secured at an old curio shop in Monte Carlo by Captain Chas. H. Donnelly, A. E. F., on January 28, 1919.

The history of them, as given and vouched for by the old shopkeeper, is as follows:

fame finally reached the ears of Louis XIV, king of France, he was summoned by him and made court dentist. Here he treated the king, but as the old shopkeeper laughingly added, "It is said he spent most of his time treating the ladies of the court."



Instruments used by Louis XIV's dentist.

These instruments were made and used by a man who practiced dentistry during the seventeenth century. He traveled about the country relieving such people as needed his aid, and when his

Later he was raised to the peerage and presented with a beautiful estate near Monte Carlo which is now in existence as such. For generations his descendants lived there, but were eventually forced

into bankruptcy and the property confiscated by the creditors. The dental instruments, little valued then, were among other things which fell into the hands of the father of our shopkeeper, and had been there for years.

Judging from the time of Louis XIV the instruments must be at least two hundred and sixty years old.

The picture shows the snake-skin box holder in which the instruments were carried. To the right of the box is the handle into which were screwed the various instruments when in use. To the left of the box is very clearly seen the crude file. The instruments are held in place for the picture by sticking-wax, which conceals the screw end of each.

A New System of Dental Radiography.

By JOHN L. GARRETSON, D.D.S., Buffalo, N. Y.

AT a recent dental meeting I demonstrated a new system of taking radiographs of the teeth which makes this science more exact and simplifies the technical and operative problems.

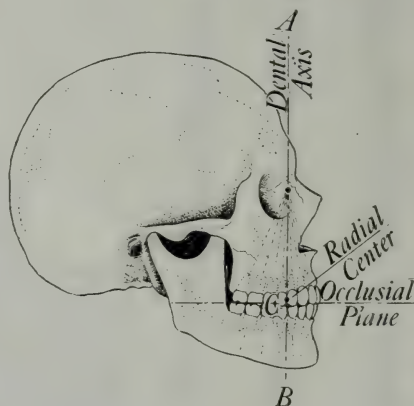
The average busy dentist has not taken up the X-ray, because he has not been able to convince himself that he could lighten his burden by adding a working knowledge of a new science to a practice already so congested with innumerable processes that he is in a quandary and wonders where to draw the line. On the other hand, the progress of dental science practically demands the assistance of the X-ray as an adjunct to the up-to-date office. Therefore I feel that my simplification of the problem and reduction of operative processes, with the consequent time-saving, will be of interest and value to the profession, as well as scientifically recording the angle of observation.

My theory is based on the principle that when the X-ray beam is correctly directed there is one point in the center of the mouth at which the beam points, no matter which tooth is being radiographed.

This point lies in the occlusal plane, in the median line, and about 15 mm. inside of the incisor teeth. The variation in the size and shape of the average

human skull is so limited as to be a practically negligible factor. This point we shall call the radial center (point *C* in Figs. 1 and 3). It is the point determined by dropping a perpendicular from the interocular center to the occlusal

FIG. 1.



plane. A brief study of Figs. 1 and 3 will show more clearly the relation of point *C*, or radial center, the angles of the teeth, and the interocular center.

The interocular center lies in the bridge of the nose, midway between the pupils of the eyes. It will be noted that the longitudinal axes of the upper teeth

converge approximately in the interocular center. Thus I have established this perpendicular from the interocular

FIG. 2.

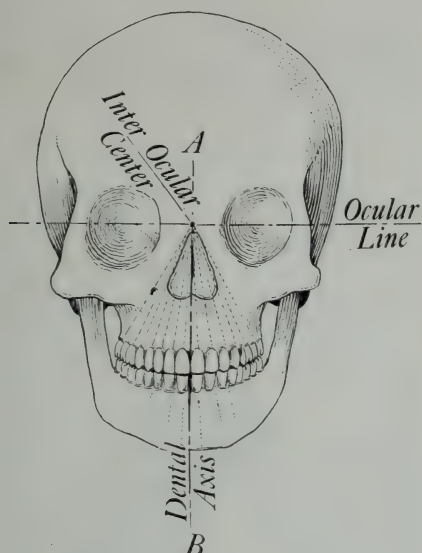
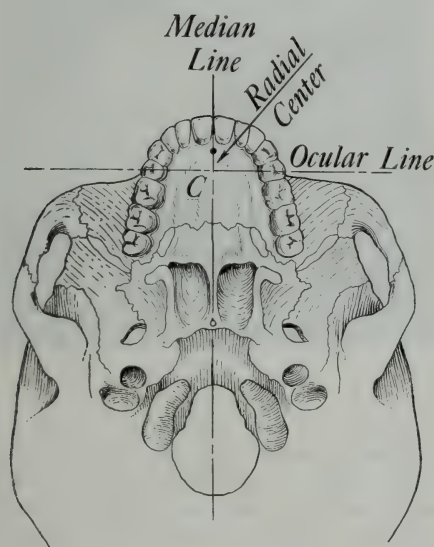


FIG. 3.



center to the occlusal plane as a logical basis for my technique. I shall call this line the dental axis. The teeth in

the lower jaw converge downward, at a smaller angle, to be sure, but nevertheless symmetrically placed in regard to the dental axis above mentioned. From this exposition, it will be seen that a machine so designed as to direct the X-ray beam at all times toward the radial center, point *C*, will not only save time by limiting the number of motions and adjustments necessary before getting the tube into the desired position, but practically will go automatically to the correct position for taking the tooth in question.

Now, having established the radial center as a fixed point within the patient's mouth, the angle of observation is noted on the meter *N* (Fig. 6) above the head, and the meter *z* on a line with the patient's mouth, and the readings of these meters are recorded for future use should it be necessary to retake the radiograph from the same angle. This establishes a definiteness of aim and gives a record of the dental radiogram which has never before been thought possible. Thus our record may read *N*-10 — *z*-90, or *N*-7 — *z*-30, or whatever the meter indicates; so it may be seen that we have our bearings or range established as definitely as the mariner with his sextant and compass finds his latitude and longitude.

It was after considerable study and experiment that I was able to secure the proper arrangement of chair and tube-stand to work out the theory and make it of practical value.

The machine which has been designed to operate in accord with the above idea, and with which I have tested the theory by taking over a thousand radiographs, is so constructed that the tube at all times points at the radial center and revolves for its successive positions about the dental axis. This set of movements is effected by a tube-carrier consisting of two movable arms so constructed as to be easily placed in the desired position, the upper joints swinging on the dental axis, the lower joint being in the occlusal plane. In addition, the machine is so flexible as to allow for any other change of angle should a gross deformity be encountered.

TECHNIQUE OF TAKING THE RADIOGRAPH.

Swing the arm o-x (see Fig. 6) to one side by turning it on the pivot o-k. This is to allow ready access to the chair by the patient.

When the patient is seated, return the arm o-k to the central position where it automatically centers. Turn the wheel

C in the patient's mouth. Steady the head by bringing up the head-rest against the patient's head. Next take hold of the handle p and in one operation lift or lower to the desired angle and swing the tube so as to point at the tooth under consideration. Place the film in the mouth as usual, make the exposure, and record the meter readings.

FIG. 4.



Lower molar position.

FIG. 5.



Lower incisor position.

W until the line u-z is on the line of the mouth. Adjust the wheel x until the pivot is over a point about three-quarters of an inch inside the incisor teeth—or, in other words, adjust the dental axis of the patient to approximate the vertical axis of the machine. These two adjustments cause the axis of the X-ray tube to be directed at the radial center, point

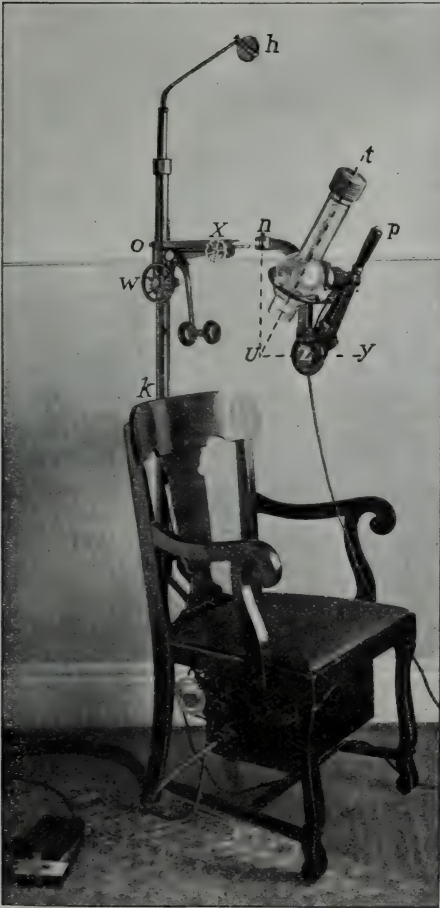
Other features embodied in the machine, apart from the theoretical side above mentioned, are (a) combination of apparatus with the chair, (b) protective placing of high-tension wires, (c) simplicity and uniformity of the electrical features.

The chair form of apparatus, as I have it, has proved to be so convenient that

I believe it to be the ultimate form for dental X-ray apparatus.

The high-tension wire H-T occupies a position as far as possible away from

FIG. 6.



Upper incisor position.

the patient, and the interposition of the metal of the tube-carrier, which is grounded, affords additional protection to the patient. The negative end of the tube is grounded so that the hand may be placed on this line, or on the arm

z-p during the exposure. The current necessary is such as would be sufficient for an electric toaster or flatiron. The very small amount of current needed for so powerful a machine is accounted for by its high efficiency transformer, which is placed under the seat of the chair, has no moving parts, and requires no thought or attention.

The question of protection to both the operator and the patient has been amply taken care of, and after a prolonged experience I feel that I have been playing on the safe side by a large margin. The ray is always directed away from the operator, and the heavy lead-glass shield around the X-ray tube completely protects him.

The radiator type of Coolidge dental X-ray tube, which has been developed to meet the special requirements of dental radiography, is piece and part of this machine, and makes for safety and uniformity of results. The signing of the armistice made it possible to select the essential parts of the famous army "bed-side unit" in the construction of this new apparatus. These have all been attached to the chair, so that this machine may be said to embody the tried and true essentials of X-ray construction that have revolutionized pre-war equipment.

In conclusion, I exhibit a few photographs of my experimental machine. The illustrations will give an idea of the construction of the chair, as well as its appearance, although since these pictures were taken many improvements have been added as they seemed necessary, including the raising of the chair and the changing of the head-rest to attach to the chair-back. Of particular interest will be the photographs showing the tube in position to take the upper or the lower incisors. All who have had experience in taking these pictures will recognize this to be the most awkward situation they are called upon to handle.

200 HODGE AVE.

The War and the Dental Profession:

Being the Report of the Correspondent (1919), Dental Society of the State of New York.

By ARTHUR W. SMITH, D.D.S., Rochester, N. Y.

(Read at the fifty-first annual meeting of the society, at Syracuse, N. Y., June 12, 1919.)

DENTAL literature during the past two years has been replete with editorials and essays extolling the service which the dental profession has rendered in the war. Since the signing of the armistice it has become evident that the war has brought about some important changes in the profession. With the view of determining, in part at least, to what extent such change has occurred, a list of questions was compiled and sent to about fifty practitioners throughout the country.

Unfortunately, a comparatively small number of replies were received. This is no doubt due to the fact that the men who have been in the service have either not returned or have been back only a short time, and that those who have remained at home have been unusually busy.

However, sufficiently numerous and widespread replies have been received to make a widely varied collection of opinions.

QUESTIONS AND ANSWERS.

These were as follows:

QUESTION 1—*Do you recognize that the war has brought about any appreciable change in the dental profession?*

"Yes," answered by 10. "No," answered by 3.

Quotations.

C. Edmund Kells: "I can but believe it must have, among those who remained in this country and who took the most active parts

in the great work which dentistry rendered to the cause, and also a very great change in the few who were allowed to go across. As to the bulk of the profession, I fear not."

B. Holly Smith: "Surgeons at the front and at base hospitals have declared that the war work in France of the dentist was a revelation. These statements promulgated everywhere necessarily increased the appreciation of the officers of the army, and the public in general, of the dentist and his usefulness in the emergency of the hour."

Wm. D. Tracy: "Their vision in regard to public service has been broadened."

QUESTION 2—*Do you believe that there has been any marked change in the methods of the individual practitioner?*

Only 2 answered "Yes." The others answered either "No," "Not much," or "Not yet."

Quotations.

I. N. Broomell: "This will follow in time."

L. A. Timmerman: "With those who have been in the service, yes."

Otto U. King: "Slight change; nothing marked."

QUESTION 3—*Is there a tendency for the general practitioner to study and practice more and better oral surgery?*

Nearly all answered "Yes"—some with reservations.

Quotations.

Dr. Broomell: "Better, but probably not more."

Theodor Blum: "More, but not better."

B. Holly Smith: "Oh yes, interest is contagious—even those who didn't go will want to be ready to meet those who did when they come home."

Dr. Tracy: "This tendency was noticed before the war. No doubt the influences at work during the period of the war have stimulated interest in oral surgery."

QUESTION 4—*Do you think that the proportion of oral surgeons will be increased?*

There was little difference of opinion here. The answers were all in the affirmative, with the one exception of Dr. Wheeler.

QUESTION 5—*Do you think that the interest in scientific research will be stimulated?*

Answered in the affirmative, 12; in the negative, 1.

Quotations.

Dr. King: "Yes. The Government has already recognized a National Research Council, and in this commission the dental profession has one representative."

Dr. Tracy: "I can see how certain data obtained by army dental surgeons may be of value to trained research workers, but I had not thought of scientific research in the dental field being stimulated by war conditions."

Dr. Kells: "Fear not, in the profession as a whole."

Dr. Smith: "The dental rabble will go wild, and many bulls will visit china shops, but on the whole many worthy enterprises in study will be undertaken."

QUESTION 6—*Do you believe that the standard of the profession has been elevated in the eyes of the laity?*

All answered "Yes" except Drs. Blum and Wheeler.

QUESTION 7 (A)—*Have you observed that the importance of dental care is more appreciated by all classes?*

Nearly all answered "Yes."

Quotations.

H. B. Butler: "Have not had the opportunity of observing all classes, but it is better appreciated among the troops."

Dr. Smith: "Yes; the demand by the military authorities for passable mouths would itself produce such a result."

Dr. Kells: "I have observed a steady increase during the entire forty-one years of my practice."

(B)—*If so, do you consider that the Preparedness League was the chief agent in bringing this about?*

Opinions were divided here, as you will observe:

Quotations.

Dr. Broomell: "Not altogether."

Dr. J. Wright Beach: "Most important influence."

Dr. Blum: "No."

Dr. Butler: "The P. L. A. D. did a mighty work, of which I have seen much and found it greatly appreciated by the men, but I should not place it above the dental corps in this respect."

Dr. Greenwell: "Helped, but mostly army requirements."

Dr. Kells: "No." (This he explained in his answer to the preceding question.)

Dr. King: "No."

Dr. Smith: "The Preparedness League did a splendid work—more, I think, than any single influence."

Dr. Timmerman: "No."

Dr. Tracy: "The influence of the Preparedness League has, no doubt, been paramount in bringing about this increased appreciation in regard to the importance of proper dental treatment."

Dr. Wheeler: "No."

(C)—*If not, what agent or agents were chiefly responsible?*

The answers were as follows:

Quotations.

Dr. Broomell: "General propaganda."

Dr. Beach: "The dental corps a material factor."

Dr. Wheeler: "Good work of good men who talked little."

Dr. King: "Many agencies have contributed to this—legislation, commissioned dentists in the army and navy, oral hygiene propaganda, the Preparedness League, and organized dentistry, 27,000 members of the N. D. A. making a tremendous force back of Congress for legislation and due recognition of dentistry."

QUESTION 8—*Do you think that the standard of the students entering dental colleges will be elevated?*

Here we find only a slight difference of opinion.

Quotations.

Dr. Broomell: "I sincerely hope so."

Dr. Beach: "Not within the next five years."

Dr. Blum: "Yes."

Dr. Kells: "That I cannot say."

Dr. King: "Yes. There will be more of a serious side to life than before the war. Citizenship will have a new meaning and responsibility."

Dr. Timerman: "Not for some years."

Dr. Tracy: "I think the general trend of dental education is toward higher standards; entrance requirements will be more rigid, courses will be more comprehensive, and tests for graduation and registration will be more exacting. These changes are matters of educational evolution, and to my mind have not been influenced by war conditions."

QUESTION 9—*If you have not been in the service, in what way have you been handicapped or inconvenienced?*

Quotations.

Dr. Broomell: "Generally increased amount of work to do."

Dr. Beach: "Handicapped because of no more time and ability to serve."

Dr. Blum: "No way."

Dr. Kells: "Old age!"

Dr. Smith: "Sacrifice of time and material was always a pleasure and not an inconvenience."

Dr. Tracy: "I have not been in the service, and the only handicap I have suffered was due to time voluntarily devoted to various types of war work in the interest of the soldiers. This work, however, we did not look upon as a handicap, but as a special privilege which we were glad to accept."

Dr. Wheeler: "Incompetence at the top."

Dr. H. E. Friesell: "Too much work in practice, due to absence of dentists in service. Too many complications in school work due to war."

QUESTION 10 (A)—*If you have been in the service, do you find it difficult to return to your former practice?*

(B)—*If so, to what do you attribute this?*

Only two replies were received from men who had been in the service, and both answered "Yes."

Some who had not been in the service gave answers which are worthy of note.

Quotations.

Dr. Beach: "Many have found their practices scattered beyond recall."

Dr. Tracy: "I should think that abandoning one's practice for months at a time would produce a condition which might be difficult to set right. Loss of office, loss of *clientèle*, the difficulties of finding a desirable new location and the delay in obtaining a new outfit are some of the factors."

Of the two who had been in the service Dr. Timerman replied that "army life" had made it difficult for him to return to private practice, and Dr. Butler, who is still in service, answered, "A different view and a desire to take up a broader work."

QUESTION 11 — *What important changes, if any, have occurred in* (A) Operative dentistry, (B) Prosthetic dentistry, (C) Oral surgery?

Quotations.

Dr. Beach: "Developed some new procedures in operative dentistry. Great developments in connection with mechanical reconstruction and restorations. The means of a new era in oral surgery."

Dr. Blum: "None."

Dr. Butler: Operative dentistry—"None." Prosthetic dentistry—"Many new ideas in making splints." Oral surgery—"A more extensive knowledge of plastic surgery, both here and abroad."

Dr. King: "A tendency to render more efficient service."

Dr. Smith: "Surgical procedures have changed. The interdental splint has come into its own, and the surgeon's wiring and bandaging have been found wanting."

Dr. Friesell: "Operative dentistry—greater care and thoroughness. Prosthetic dentistry—decided improvement and appreciation of the importance of this work. Oral surgery—a desire to learn and do more, as a result of the recognition of its possibilities."

Dr. Tracy: Operative dentistry—"The tendency to condemn all non-vital teeth to the forceps is becoming more universal, partly because of the findings of certain army dental surgeons." Prosthetic dentistry—"The army regulations requiring fixed bridge work instead of plates and removable saddles, etc., it seems to the writer, has had a deleterious influence on prosthetic dentistry, even though the reasons for fixed bridge work were thoroughly understood." Oral surgery—"The

knowledge that the army oral surgeons gained during war activities will undoubtedly have a far-reaching influence upon the special field of oral surgery as practiced by private practitioners."

The last question was—

QUESTION 12—*What do you consider the greatest benefit you have derived from the war?*

The replies were as follows:

Quotations.

Dr. Beach: "Greatest personal benefit has been a consciousness of worth-while service."

Dr. Blum: "None, as far as the profession is concerned."

Dr. Wheeler: "None."

Dr. Friesell: "An appreciation of American citizenship, greater pride (if possible) in my profession, and a high regard for peace, and less rush in human affairs."

Dr. Butler: "First, I was placed in a position as instructor, where I had to study mighty hard to make good; and second, a close contact with the medical man and a decided effort to bring the two branches of the service into closer relation with each other has been of greatest advantage to me. I have had the good fortune to be able to speak to assemblages of medical men on mouth conditions, have received the most courteous treatment from the army surgeons; have seen permanent results from the effort, and consider it the best thing I have ever accomplished. The opportunity was most unusual."

Dr. Greenwell: "Brotherly love."

Dr. King: "An enlarged vision and responsibility, in citizenship and professionally. Also along economic, spiritual, and social lines."

Dr. Tracy: "The greatest benefit I have derived from the war is an increased love of country, an awakened sense of satisfaction in service for others, and a satisfying realization

of the fact that dentistry as a profession can be counted upon in an emergency to do the big and loyal thing, as has been proven through its activities during the period of the war."

Dr. Smith: "Cannot say that I have derived any personal benefit from the war; quite the contrary. I have lived ten years in two, but long enough to see my three boys return with honorable records of service, one with a Croix de Guerre, but all to find their places filled, and their dad their chief support. But, thank God, we are all willing to start over again, unafraid."

To summarize these opinions is difficult. It seems obvious, however, that great changes are taking place in the profession as a direct outcome of the war, especially in the field of oral surgery; that the medical profession and the laity have a greater respect for the dentists and the services they render, and that the members of the dental profession in general have been elevated to a higher plane and are more strongly united in their efforts to benefit mankind.

This report is not an exhaustive study of conditions, as you have already discovered. It only touches the surface. The question of newly established international relations is in itself a great study. Time alone will show how far-reaching are the results which will eventually occur.

The Correspondent wishes to express, on the behalf of this society, his thanks and appreciation for the co-operation of the men who have made this report possible.

33 CHESTNUT ST.

[See also *Discussion*, as reported under "Proceedings of Societies," this issue.]

Report of the Oral Hygiene Inspector, University of the State of New York

TO THE

Dental Society of the State of New York.

By WM. H. LEAK, D.D.S., Albany, N. Y.

(Presented at the annual meeting of the society, at Syracuse, June 12, 1919.)

MR. PRESIDENT AND MEMBERS OF THE STATE
DENTAL SOCIETY:

THROUGH the personal activities of the members of this society and through the work of the society during the past years, the subject of Oral Hygiene has been brought into such prominence that our State Department of Education has realized the importance of the question and the necessity of giving more definite instruction to the children of our state on the care of the mouth and teeth. Coming to this decision, the State Department of Education has created the office of Oral Hygiene Inspector, and last November appointed me to that position.

I believe it was the thought of our State Education Department that my prime duty would be the establishment of school dental dispensaries. Thus the official title, "inspector," is accounted for. In the development of my work, however, while I have not lost sight of the value of encouraging the establishment of school dental dispensaries, and of extending their services, I have placed the major value upon the necessity of proper instruction to our school children on the subject of oral hygiene, and believe that my position would be more aptly defined by the term Oral Hygiene Instructor, or Director.

Considering briefly, first, the subject of dental dispensaries, we have—

First: New York City, with its more or less complex situation.

Buffalo, with its dental school and dental clinic. Buffalo also has three other dental dispensaries, and I believe a plan for installing a dental dispensary in each of its new schools.

Rochester, with its adequate dental dispensary.

Second: Outside of these first-class cities, we have seventeen school dental dispensaries in cities of 30,000 or more. Auburn and Amsterdam being the only two cities of this size without dental dispensaries. Auburn, I have the assurance, will have such provision very soon, and Amsterdam is not going to be long in getting into line. We have fourteen other smaller towns with school dental dispensaries. Thus, we have more dental dispensaries in operation than most of us are accustomed to think.

We have made several attempts at the starting of rural dental dispensaries, but have now just managed to get the first one under way. Through the Junior Red Cross of Nassau county we expect to have in operation in that county an efficient Rural Dental Dispensary Car, and I am very certain that it is but the starting-point of this important work and that soon we shall have many such in this state.

In cities and towns outside of places with dental dispensaries we have about

250 dentists who have signed cards stating their willingness to do practically free dental service for children in their respective communities whose parents are unable to pay for the work—and there is probably no dentist in the state who would refuse such a service.

Thus we see at a glance that a vast amount of reparative work is being done for the children of poor parentage. I doubt if the teeth of children of well-to-do parents and of the middle class are receiving as good attention. We frequently hear it stated, and I presume that the most of us know, that fully 90 per cent. of our children have decayed teeth. But, do we all know that 30 per cent. of our children in the first grade have abscessed teeth, and that every fourth or fifth child has not the proper masticating surface? and that these conditions continue and grow worse up to the fifth and sixth grades, when the child becomes of such an age that the deciduous teeth, or what is or is not left of them, are replaced by the permanent teeth?

Facing such extremely bad mouth conditions, where reparative work is necessary to correct the damage done, it will be far better if we can institute some method of prevention; and this, I am sure, can only be done through education.

Educational authorities are agreed that in the past we have not given the proper consideration to the care of the child's health. In contemplation of introducing the work or activity which will probably become known as Health Education, the leaders in education have many things which they must consider. The instruction of the child must be done in the main by the regular school teacher. We cannot look for instruction on nutrition, for example, to be given by a specialist on nutrition, any more than reading, writing, geography, or arithmetic might be given by specialists in these branches. This means, then, the need of instruction of teachers on health subjects. At teachers' meetings and conferences and by attending summer school courses, those who

are now teaching may possibly secure this instruction, though all of you can realize at a glance that such instruction would be meager. The summer schools offer the best means, but I fear not a large percentage of our teachers avail themselves of this opportunity. In preparing teachers in our normal schools, the principals of these institutions are already in a quandary as to how to give the instruction already required in a period of two years of time; so that to introduce another subject, and one so comprehensive and demanding so much time as health education, presents for our educators a very difficult situation. Nor can the problem be solved by an extension of the normal course from two to four years, as we are hopeful may at some time be realized. With the small amount paid teachers today, even adding the five million dollars appropriation approved by our last legislature, the amount to be paid teachers is yet so small that there is not going to be a stampede of persons to enter our normal schools to train for teachers. And if the time is increased to even three years of preparatory work, many will be discouraged from entering the ranks of the teaching profession; while again, today we have a dearth of teachers and it is necessary to prepare teachers in the shortest time possible.

It becomes necessary, then, that the people of our state, and particularly those occupying the important and leading positions of life and those who are especially informed with regard to the value of proper instruction on health subjects, shall give this matter serious consideration. From all communities and cities we hear the cry of "higher taxation!" It would seem that we have reached the maximum in taxation, but we have not. The health education program is extensive, almost revolutionary in comparison with what we have had. Our recent war experiences have taught us the absolute necessity to improve ourselves physically. This matter as well as other lessons which we have taken from the recent world conflict will demand of us large expenditures

of money if we are to avail ourselves of the knowledge gained.

Coming back now definitely to the dental phase of the subject: Go where you will—from the rural school teacher of eight grades in one room to the teacher of any grade in our largest cities—and you will find them unanimously placing more emphasis upon the necessity for better mouth cleanliness than upon any other health matter. School medical inspectors, school nurses, physical trainers, as well as school dentists and dental hygienists, are all agreed that the teaching of cleanliness and care of the mouth are of first importance. One of the most interesting items of which I have learned in this connection is the fact that two high schools in New York City require that the students have their teeth attended to prior to graduation.

Under the stress and anxiety of war we had a compulsory school military training, which in our state took on the phase of physical training. This was administered by the military training commission under the department of Education. With the close of the war this activity is now being taken over by our State Department of Education, and is to be administered by them. Their organization is good and complete; they have a supervisor of physical education and nine assistant inspectors of physical training at salaries of \$3000 per year and traveling expenses. The state is divided into eighteen zones, over each of which a teacher of physical education presides, at a salary of \$1500 and traveling expenses. Once each month all teachers of each zone are required to assemble for instruction from their teacher of physical education. The teachers' traveling expenses are paid by the state, and they are allowed \$1.00 per day. This means an expense of approximately \$200,000 per year to the state.

In the development of our Health educational activities it is only fair and just that the whole be done in unison, and that no particular phase or branch of the work should outstrip any other. This is the attitude of Dr. Howe, our State Medical Inspector; in fact, the

phrase which I have just used is one which I only recently heard him use. I believe, to properly place the subject of oral hygiene before our school children, we should have ten full-time dentists employed, each having supervision over a section of the state with a normal school as a part of his section. I believe that if physical instruction is of such importance that our teachers should be called together monthly for special instruction on that subject, oral hygiene is also of sufficient importance to be presented in a like manner. And I can see no good reason, as long as these teachers are thus assembled, why instruction on oral hygiene should not be also given.

In presenting this subject to you I have only been dealing with the work as done along health lines by the State Department of Education. We have also our efficiently organized State Health Department doing an extensive work without a dentist in the department. We have our various state penal, corrective, hospital, and charitable institutions, but with practically no dentists on their staffs.

In the manufacture of supplies and in the preparation of men for the army I know of no trade or profession which made such sacrifices as did the dental profession. Most tradesmen, I believe, received excessively high compensation for war work; many business men made fortunes, and almost all professional men, if not paid excessively, did at least receive pay for the services rendered. An exception to this was the service rendered by the medical profession as examiners, while the dental profession, through the Preparedness League of American Dentists, undertook the task of rendering hundreds of thousands of men dentally fit for military service free of charge, and so well was their task accomplished that only 4 per cent. were rejected because of dental conditions.

The dental profession has been and is a most liberal profession. Its practitioners in all communities are always glad to contribute their share to the aid

of their fellow citizens; but dental activities cannot long be carried on by the volunteer and liberal spirit of the dentists alone. The value of dental teachings and services to our state, county, and community should be recognized, and appropriate funds set aside to pay dentists for the services rendered. This in turn will mean better service, for the dentist who is giving the work his undivided time and attention must necessarily be in position to do better work than the dentist who is called upon to contribute occasionally of his time.

What I have in mind in presenting this brief synopsis to you is that, though feeling we should have ten dentists in our department, I have not the courage to ask for them. I purpose, however, to request that three dentists be added to the staff, and, to prevent this from being reduced to one, I beg to suggest that a committee be appointed to investigate the work which I have had the privilege of performing during the last few months, and that this committee report back to the society with recommendations, and if thought best the committee then be instructed to write the Commissioner of Education recommending that the oral hygiene work as undertaken by the department of Education be extended.

At the State Education building in Albany we have a wonderful medical library with a large dental section. Though not a member of the Library Committee of our State Society, I have taken more or less interest in this library, and have been able to secure many contributions of dental books and magazines. If you have anything of this kind to give, or even to will, I am sure that the University of the State of New York will be glad to receive it.

Due to the ease with which I have been able to secure for the library so many and some rare magazines, it occurs to me that it would be an excellent thing if through our State Society a dental museum were established in our State Education building. I have talked the matter over with Dr. Finegan, Deputy Commissioner of Education, and with Mr. Case, chief of the Administration division, and have assurances that such a move by the State Dental Society would be welcomed by them, and that desirable reservation or space would be provided for exhibiting such specimens as might be collected. The appointing of a committee to consider this matter I think would also be advisable.

EDUCATION BLDG.

CORRESPONDENCE

"Dental Care in Pregnancy."

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—Replying to Dr. Cornell's communication in the DENTAL COSMOS for July 1919, page 660, I would refer him to an article on the "Importance of Dental Supervision During Pregnancy," in the DENTAL COSMOS for April 1918, page 314. By way of explanation, at least in part, of the lack of co-operation he has experienced among dentists in caring for the mouth and teeth during gestation, I would quote the following letter from the above article, it being but one of a number that I have received of a similar nature during the past fifteen years:

Dear Doctor.—Mrs. A. informs me that she is suffering from a back tooth. As she is pregnant I advise her that she must not visit the dentist or have anything done to her teeth, unless it be merely to relieve the aching tooth. You understand the seriousness of the situation, and therefore if you will avoid doing anything but what is absolutely necessary to make her comfortable, I will greatly appreciate it.

Yours truly,

December 5, 1913.

Both the dentists and the laity have been pretty generally served with injunctions of this character. The impression that the teeth must not be worked upon during pregnancy, and that the loss of "a

tooth for a child" was to be preferred to the creating of some physical defect in the fetus, or to the possibility of a miscarriage, prevailed not only in the medical and dental professions, but had been communicated to the laity. It is unfortunate that in these modern times such erroneous teaching should have any weight with intelligent practitioners of either profession. Many teeth have been lost and much suffering caused by ignorance along these lines.

I have been caring for a great many patients during gestation, and generally in conjunction with the obstetrician in charge of the case, and I have never experienced the slightest trouble. It is indeed gratifying to find at the end of the period absolutely no decalcification of the tooth tissues.

It frequently happens that the investing tissues are in need of constant attention, as the systemic condition is manifested orally by gingivitis, hypertrophy, or tumefaction, all of which require specific remedial measures; moreover, it is just as important—in fact, more so—to eradicate focal infection during gestation than at any other time. There is no field more in need of preventive dentistry than the care of the mouth and teeth during pregnancy.

J. CLARENCE SALVAS.

PHILADELPHIA, PA.

PROCEEDINGS OF SOCIETIES

Dental Society of the State of New York.

Fifty-first Annual Meeting, held at Syracuse, N. Y., June 12, 13, and 14, 1919.

THE fifty-first annual meeting of the Dental Society of the State of New York was held in Syracuse, N. Y., on June 12, 13, and 14, 1919, in the ball-room of the Hotel Onondaga.

THURSDAY—*Morning Session.*

The meeting was called to order at 10.15 A.M. by the president, Dr. George B. Beach of Syracuse.

Dr. DEWITT B. THOMPSON of Syracuse invoked divine blessings upon the deliberations of the society.

Mr. CARL DORR, Syracuse, welcomed the society to the city on behalf of Mayor Stone.

Dr. W. D. TRACY, New York City, responded to the address of welcome on behalf of the society.

The vice-president, Dr. Gould, then took the chair, while President BEACH read his address, as follows:

President's Address.

By GEORGE B. BEACH, D.D.S., Syracuse, N. Y.

At the last annual session of the New York State Dental Society we celebrated the fiftieth anniversary of the founding of our society; we are now entering our second cycle of fifty years.

Great progress has been made in our profession in the first half-century of organized dental practice in this state,

and there are young men present today who will complete the second cycle of fifty years, and be able to record the much greater progress which we are sure will be experienced during the next fifty years.

DENTISTRY'S PART IN THE WORLD WAR.

It is impossible to review the activities of our society during the past year without reference to the great conflict, in which our entire profession has been in some manner engaged.

In the past four years thirty-two manifestos severing diplomatic relations, and fifty-nine declarations of war have been made. In all, thirty-four nations participated in the most destructive world war ever recorded, in which millions of men have been killed, and property worth billions destroyed, and as I have said, our entire profession has been in some manner engaged in this war. Not all our men could go to the front, but it is a matter of record that when enlistments in the dental corps of the United States army were called for, ten thousand of our best professional men in the United States responded, and the enlistments were soon closed. These men left their offices and went to camp; not all were sent to France, but they served their country faithfully wherever they were placed.

In the city in which this meeting is held one out of every four practicing

dentists was in the service, and what was true in this city was likewise true of other cities in New York State. The men responded to the call. Those who remained in practice were performing service upon draft boards, and doing the work of the Preparedness League. The Preparedness League of America performed 500,000 operations in rendering men fit for service.

We are proud to call to your attention the part in this great work performed by the members of this society, and also to the time and money spent by the officers of the League in organizing and directing the work of the Preparedness League. These men are members of our New York State Dental Society. Dentistry in this state has supported the Government; we are proud of our men in service; we have made a good record. Today we greet the men who have been overseas, and in the camps at home, and as they return to civil life, and take up the practice broken by long absence, let us plan to be of some service to them.

We have learned many lessons from the war, but none comes so forcibly to us as that we have a personal duty to perform. Let me give you an illustration of what duty meant to the soldier, and it should mean no less to us. In the spring of last year, as the soldiers of France were day by day retreating, and the German armies were approaching Paris, our American troops were placed in support of the French. The orders came, as they had come consecutively for many days, to withdraw. One of our officers sent a note of six words written in miserable French to the French commander, "You tired, go rest, our job." There was no retreat that day. The battle of Chateau Thierry was fought, the Germans were turned back; hope, spirit, and power were injected into the failing, worn-out armies of the Allies. Thousands of American boys, our brothers and sons, lay wounded or dead, but they had done their duty. It was their job, and they performed it well. Let us appropriate this lesson of the war, and be ready to give any service and perform any duty that will ad-

vance the profession of dentistry in this state.

Peace has come, and the period of restoration and reconstruction has begun. This process relates proportionately to the countries involved and devastated. The closer contact of the medical and dental professions brought about by war activities, with the recognized need of each profession for the other, has of necessity brought about a reorganization and reconstruction in dental practice.

Dentistry and medicine have been brought closer together by the war. The labor performed on the field of battle, in the hospital, and in the executive offices at Washington presided over by Colonel Logan of the army dental corps and General Gorgas of the army medical corps, has all resulted in a broader understanding and a deeper respect for the problems each is trying to solve, and the service which each profession is trying to give.

At this meeting you will see illustrated the great advance made in oral surgery during the war. Many present had the pleasure of seeing and hearing Dr. Villain of France when he was touring this country the past winter, and we note from his demonstrations, showing as he did the large facial restorations and almost normal occlusion of badly broken maxillæ, how great an advance has been made in this field of dentistry.

THE DISTRICT SOCIETIES.

It has been my pleasure to visit the nine district societies of the state during the year. My visits have been made very pleasant by those at the meetings. Excellent programs have been the rule in all the districts.

The Rochester City Society has combined with the Seventh district society, and the district will hold meetings every two months during the winter. The dues have been raised in this district to ten dollars per year. The change I believe is a good one, and I would recommend that the action of the Rochester Society and the Seventh district be followed if possible by other up-state districts.

THE NATIONAL RESEARCH COMMISSION.

The finances of the district societies are in good condition. The dues have been raised where sufficient amounts were not already being paid to provide for the annual payment of one dollar per member for scientific research by the State Society. This is an attestation of our desire to have the research work carried forward, but the amount raised by this method is in no way adequate to carry forward satisfactorily the National scientific research work in dentistry. We should continue our support, and while continuing it, ask the directors of the National "Scientific Research Commission" to inaugurate a campaign for endowment, or to associate the work with some institution already possessing such financial resources as shall permit of thorough scientific progressive work in this department. I would recommend to the Executive Council that these suggestions be referred to the National Research Commission as the wish of our State Society.

On account of college commencements in which our essayists and many members are interested being held about the second week of June, I would suggest that our annual meeting be called the last of May or the first week of June, the Council having the power of adjournment to any time or place.

Inasmuch as our meetings are no longer held in the same city, and because of the liability of destruction by moving annually, I recommend that the pictures which have for years been placed on the rostrum at our annual meeting be hung permanently as the Executive Council shall direct, the pictures to remain the property of the society, and subject to removal upon any anniversary occasion or on request of the State Dental Society.

MEMBERSHIP.

The membership of the State Society has increased during the past year. A normal increase is reported from all the districts. The First district elected 224 new members, which shows that special

work was done in this district by the officers and membership committee.

The Fifth district elected 45 new members, and by electing these men becomes one of the districts that have over 50 per cent. of those registered in the district as members of the society. The State Society should have as members more than 50 per cent. of those practicing in the state. If we had this ratio our membership would be about 2800. Our membership is now about 2000, and the showing is good in comparison with former years. Each member receives the *National Dental Journal*, and as our state societies grow in numbers the *National Journal* also enlarges its circulation. It has now a circulation well above 25,000 copies per month, and as it grows it becomes of greater educational value. It is our magazine, and organized dentistry feels justly proud of it. It will become a great factor in the development of our profession in this country.

Through a mistake in the office of the secretary of the National Dental Association each member of our society was threatened with the loss of the March number of the *Journal*. The Secretary's contention that we had not paid for the *Journal* for the current year was so tenaciously held, even in the face of a copy of our records of payment which our treasurer Dr. G. H. Butler sent him, that to save the loss of the *Journal* your officers went to Chicago. The secretary was shown his error, and acknowledged it. Bills for this trip will be presented to the Executive Council for audit, accompanying these bills will be our correspondence with the secretary. I recommend that the Executive Council, through our treasurer, present a bill covering these items to the National Dental Association to reimburse our State Society.

ROCHESTER DENTAL DISPENSARY.

We again congratulate Rochester. Mr. George Eastman has during the past year added \$250,000 to the endowment of the Eastman Dispensary. The total amount

given by Mr. Eastman for this work is \$1,500,000. This added gift shows the estimate which Mr. Eastman puts upon the work at that institution, and is also a high compliment to the manager of the dispensary, Dr. H. J. Burkhart. It has been my pleasure to visit the institution this year, and too much praise cannot be given the work. The war has made the task of Dr. Burkhart and his assistants difficult, but the work has progressed. The equipment is the best, the general atmosphere of the place is cheerful, and all reflects thorough organization and good management. I hope as this work becomes known other communities may be similarly provided.

DENTAL LEGISLATION.

During the last session of the legislature determined effort was made at Albany to pass a Health Insurance bill the provisions of which were not satisfactory to the medical or dental professions in this state. The measure provided among other things for contract dentistry, the rates for service to be made by a board of directors, who should conduct the affairs of a group of people. The bill was passed in the Senate, but was held in the House. The Legislative Committee of our society, your officers, and the district societies were all active in their opposition to this measure. In the closing days of the session the medical men were favored by an amendment which gave the district medical societies some representation upon the board fixing the rates of compensation. It is believed that at next session of the legislature some legislation on health insurance will be enacted. I therefore recommend that the Executive Council appoint a committee to confer with state officers, with the state medical society, and with those charged with drafting this measure, so that dentistry will be accorded the same provisions as other professions in any legislation which may be enacted. No legislation providing so radical changes as were provided in the Health Insurance bill presented this year have ever been seriously proposed in this

state, and our profession should be thoroughly informed of the provisions incorporated in the bill to be presented at the next session of the legislature.

STATE ORAL HYGIENE INSPECTOR.

The State Educational Department has appointed Dr. Wm. H. Leak oral hygiene inspector in the schools of the state. He has charge of the educational work in oral hygiene, and has begun his work by lecturing in the normal schools and colleges, and before the teachers of the state. His work has been well received, and the lectures given to those who are to become the teachers in our public schools have a definite educational value. Dr. Leak will appear on the program of the meeting, and I should like our Executive Council to commend his work by writing the Education department at Albany. Dr. Leak should have assistance by the appointment of others to co-operate with him. Massachusetts has appropriated \$30,000 this year for oral hygiene work in that state. All reports are unanimous in showing the interest in this subject throughout the country.

I was much interested in my visit to the Metropolitan clinic, and wish to commend the work being done in oral hygiene under the direction of Dr. Hyatt. The work at the Metropolitan clinic is constructive, the company now requiring all employees at the home office to have their teeth inspected and cleaned by their family dentist, or have the operation performed at the clinic. Because of the successful work done at this clinic many incorporated companies are opening departments of oral hygiene. The state should appoint an inspector to have charge of the work done in the factories, and co-ordinate the work done in the industrial oral hygiene movement. Best results will accrue by systematic effort.

The work of the year has been made easier by the activity of the district societies, by the co-operation of all the committees, and by the earnest work of the officers associated with me. I wish

to express to them and to you all my sincere thanks for your co-operation.

The President's Address was referred to the Committee on President's Address, consisting of Dr. Meisburger, Dr. Wheeler, and Dr. Needham. Dr. Wheeler being absent, the chair appointed in his place Dr. Fancher.

Dr. ARTHUR W. SMITH of Rochester, Correspondent, then read his report, his subject being "The War and the Dental Profession."

[This paper is printed in full at page 866 of the present issue of the *Cosmos*.]

DISCUSSION.

Dr. W. D. Tracy, New York City. The report submitted by Dr. Smith is unique, and has laid before us evidence of a wide variation of opinion upon some points among the gentlemen with whom he corresponded, while on certain other points they seem to be quite of one mind.

Question 1 asks, "Do you recognize that the war has brought about any appreciable change in the dental profession?"

As one of those to whom these questions were addressed, I assumed that the Correspondent meant the members of the dental profession, and I answered it accordingly by saying that "Their vision in regard to public service has been broadened."

Dr. B. Holly Smith in answering this question seems to have interpreted the question as if it applied to the practice of dentistry instead of the dental profession, and when he says, "Surgeons at the front and at base hospitals have declared that the war work in France of the dentist was a revelation," we must warmly agree with him.

The dentists, not unlike most all other specialists during the war, had new problems to cope with, and the manner in which they met these problems and devised ways and means of dealing with them, to gain the desired results, was a revelation indeed.

Again did necessity prove herself the

mother of invention and a stimulus to inspiration and achievement. Operations in oral surgery which before the actual cases were presented would have been considered impossible were done under the spur of necessity, and prosthetic restorations were devised, made, and applied as a result of that same pressing need.

If that is the way the Correspondent meant that question to be interpreted we must admit that there have been some changes in the practice of dentistry as far as the special fields covered by the oral surgeon and the prosthetists are concerned.

It is not necessary, perhaps, to discuss each of the Correspondent's questions in detail, but some of them are of special interest.

Question 3, for instance, inquires whether there is a tendency for the general practitioner to practice more and better oral surgery. The question is in itself interesting; but note the divergence of opinion in the replies: One prominent gentleman says, "Better, but probably not more," and another prominent gentleman says, "More, but not better." Personally I am inclined to believe that there is some truth in both of the replies, and that among general practitioners there is more oral surgery done today than ever before, and I am convinced that the standard of oral surgery among general practitioners is better than ever before. It would be difficult, however, to estimate just how much this special field of work has been influenced by the war as far as general practitioners are concerned, though we know of the great advances that have occurred in oral surgery as practiced in the army hospitals.

Question 5 says, "Do you think that the interest in scientific research will be stimulated?"

It is my opinion that scientific research, while progressing all the time, is apt to have its greatest development at irregular intervals, and that it is dependent not so much on activities taking place in the outside world as it is upon the finding of individuals of special capacity

and inspiration who for the love of science and truth devote themselves to the study of abstruse problems. The fact that there are throughout the country many so-called "study clubs," some of which have gone seriously into research work is a promising indication that many dentists are awake to the need for more definite knowledge along many lines. However, as I stated in my answer to the question, I do not see that scientific research in the broader sense, as applied to dentistry, has been stimulated by the world war.

Question 7 (A) says, "Have you observed that the importance of dental care is more appreciated by all classes?"

To this question Dr. Kells answers, "I have observed a steady increase during the entire forty-one years of my practice."

I think every observant practitioner feels just as Dr. Kells does on this point—that dental care is more and more appreciated by all classes.

The operation of the draft law in our country has no doubt brought dental ailments or dental defects more definitely to the minds of men of draft age than ever before. And in connection with the operation of the draft law the Preparedness League of American Dentists, through its widespread and constant activity in gratuitous treatment of drafted men, brought to these men a knowledge, an understanding, and an appreciation of dentistry that they never would have had if the United States had not declared war on the common enemy of mankind, and if the Preparedness League had not, through its members, performed three-quarters of a million of dental operations of all kinds.

You will notice there is a discrepancy between Dr. Beach's report and mine. We have a report of 736,000 free dental operations during the period of our activity. In passing I might say, that does not fairly represent the real amount of work done, because we have evidence that there was work done all over the country of which no adequate report had been made.

No doubt teeth and dentistry were

discussed in the homes of thousands where little if any thought was ever given to the subject before, and in this way information and interest were spread among parents and children alike, and naturally this would result in a wider appreciation of the importance of dental care.

Not having been connected with the dental corps of the U. S. army I cannot discuss any of these questions from the army man's viewpoint. I can, however, realize the sacrifices that most of the members of the dental corps made when they gave up their practices and closed their offices and joined the corps, and we can all realize, I am sure, the many difficulties that face the member of the dental corps when he returns to civil life and undertakes to re-establish himself and resume practice.

The dental profession at large is grateful to the dental corps of the U. S. army for its splendid services to the soldiers and to their country.

The Correspondent's remarks in his summary of opinions received in answer to his questions are well made, and I quote them again as a fitting way of bringing this brief and yet somewhat rambling discussion to a close.

He says, "It seems obvious, however, that great changes are taking place in the profession as a direct outcome of the war, especially in the field of oral surgery; that the medical profession and the laity have a greater respect for the dentists and the services they render, and that the members of the dental profession in general have been elevated to a higher plane, and are more strongly united in their efforts to benefit mankind."

Dr. Bissell B. Palmer, Jr., New York City. Possibly a different perspective is responsible for the fact that I cannot agree with many of the opinions expressed in the Correspondent's very interesting report.

My opinions are based on my twenty-two months' service in the dental corps. The first six weeks of this time were spent in organizing and supervising the dental preparedness drive for the men

of our own 27th Division in June and July 1917. During my stay at Camp Wadsworth and Camp Stuart, and later during my travels through France, I had ample opportunity to observe and study the dental military situation, and also had many conversations with dental officers of all ranks on some of the very questions submitted by our Correspondent.

In regard to question 1, I feel that no perceptible change has occurred in the dental profession due directly to the war. The only worth-while progressive change which could have occurred would have been the abandonment by our profession of its practice of unscientific root-canal operating. A big step in the right direction would have been accomplished, particularly with the younger element of our profession, if we had had in the Surgeon-general's office during the war an officer in charge of the dental corps with vision and courage enough to issue an order prohibiting septic root-canal work. If Colonel Logan had but issued such an order to the entire dental corps he could have prevented the establishment of foci of infection in the mouths of, only Heaven knows how many, thousands of our best American men. A word from Colonel Logan would have saved many a soldier from heart, joint, and kidney infections; and in failing to issue such an order, despite the fact that its necessity was brought to his attention by such men as Dr. M. L. Rhein of New York, I feel that Colonel Logan, even with his organizing ability and achievements, has disappointed many of his friends. This matter is brought to the attention of our society because it indicates that if no change has taken place in our profession due to the war, it is not because opportunity was lacking.

In regard to question 2, I do not believe that the war has brought about any change in the methods of the individual practitioner.

In answering question 3, I think there is more of a tendency for the general practitioner to practice more but not better oral surgery, and I believe this to be caused, not by the war but because

of the operative liberties which can be taken by those who have acquired a knowledge of conduction anesthesia. Quite possibly those dental officers who took the intensive course in oral surgery may later feel qualified as civilians to practice oral surgery. I believe that the proportion of oral surgeons will be greatly increased, but this will come more because of the demands made for a growth of this specialty rather than as a result of the war.

The only way that dental scientific research will be stimulated by the war is that the harvest of secondary infections which our soldiers will reap as a result of the septic fillings sown during the war may raise such a storm of interest as to compel exhaustive and complete research on the subject.

Regarding question 6, I do not believe that the standard of the profession has been elevated in the eyes of the laity. My belief is based on two facts: (1) The many thousands of septic operations which were performed in the army, and which have already or will soon manifest ill results, will certainly reflect discredit upon the dental profession. (2) The dentist is the lowliest officer in the army, he has no dental administrative head of his corps, and during the war had practically no table of organization; he is absolutely dominated by the medical officers, and his lack of standing as an officer is quickly noticed by the enlisted men who comprise the laity.

If there is any question regarding the correctness of my opinion on this matter, I would suggest that the members of this society ask their ex-soldier patients what they think of army dentistry. Of course, there is no question about the appreciation of the soldiers of the patriotism displayed by the profession in its great work throughout the country, under the auspices of the Preparedness League.

Dental care is undoubtedly more appreciated by all classes, but I believe this fact to be related only slightly to the war, and I attribute it to general propaganda and to the common discussion by the laity of secondary infections

caused by infected teeth. It is possible that oral hygiene lectures delivered by some army dentists may have created a new interest in some quarters,

I do not believe that the war will result in a higher standard of students entering our profession, for the same reasons which I gave in answer to question 6, which related to the present laity opinion of our profession.

I do not find it difficult to return to civilian practice, where one is not dominated by officers who hold high rank and command not because of any ability or particular qualification, but merely because of their length of service. Much of the inefficiency in our dental corps is the result of having had at the head of it men absolutely devoid of organizing or executive ability, and whose only qualification is a long period of service in the army. It is common opinion that a prolonged service in the army is not necessarily even a slight qualification for such work.

I believe that the principal change in prosthetic dentistry in the war is the development of splint work and obturators. In oral surgery the advancement along plastic lines is most noticeable. In operative dentistry there has not been any great change, although I feel that the report I have submitted regarding the results of non-septic dentistry in the 27th Division, following an order which I had issued to that effect, may have an influence in creating a more radical attitude toward devitalized teeth in all cases where thorough and aseptic root-canal operations for any reason cannot be performed.

The greatest benefit I have derived from the war is the knowledge that right has prevailed, that liberty has not been shackled, and that hereafter our country will be respectfully listened to if it ever says to an offending nation, "Stop." These are the only benefits we went to war to gain, and all Americans share alike in the benefits won.

Dr. H. J. Kauffer, New York. I would like to add a few remarks on the report, which I think is timely. In answer to what war has done for dentistry,

the United States War Public Health Service is now caring for the war risk cases. It has compelled the public health service to organize clinics throughout the hospitals. These dental clinics will take care of these cases. I have brought to the attention of the gentlemen in charge of this work the necessity of scientific research, and I feel that I have made them see that it was necessary and proper that the public health service of the United States should conduct this scientific research in cases of dental foci of infection—in proper dental diagnosis and its relation to systemic diagnosis. This work, I understand, will be taken up. I have been given the privilege of conducting research work in the metropolitan district.

I was called upon to examine a number of these war-risk cases, men who had returned from the front, and I will say that in a number I examined there were no cases where any attempt had been made at root-canal work. The large bulk of the men we examined was entirely for replacing extracted teeth. This work will be conducted at the hospitals of the United States Public Health Service, and I am sure it will stimulate the interest in dentistry along that line.

Dr. Smith (closing the discussion). Inasmuch as this report is not a matter of personal opinion at all with me, there is nothing to be said. I would like to say, however, that I think Dr. Palmer's discussion will do much to neutralize the effect of the report.

Dr. W. H. Leak, Albany, Oral Hygiene Inspector, University of the State of New York, then read his report.

[This report is printed in full at page 870 of the present issue of the DENTAL COSMOS.]

THE PRESIDENT. Unless there be some objection, I will ask Dr. Leak to reduce the recommendations he has made to writing, segregate them from his paper, and present them to the Executive Council for action.

The meeting then adjourned to 2 P.M.
(To be continued.)

Pennsylvania Association of Dental Surgeons.

Meeting of May 13, 1919, at Hotel Stenton, Philadelphia.

THE meeting was called to order at 8.45 P.M. by the president, Dr. H. P. Matteossian.

The Secretary read the minutes of the last meeting, which were approved as read.

The President then introduced the speaker of the evening, Mr. WILLIAM W. ATKINSON of the University of Pennsylvania, who read a paper entitled "A Critical Consideration of Dr. G. V. Black's Method of Making and Testing Dental Amalgam Alloys."

[This paper was printed at page 735 of the August issue of the *Cosmos*.]

DISCUSSION.

Dr. James I. Woolverton, Trenton, N. J. *Mr. President and gentlemen*.—After listening to Mr. Atkinson's paper I feel that it is practically impossible for any of us to criticize the work; the records given are from the Bureau of Standards at Washington. Not one of us could doubt that the Bureau had given correct measurements and readings from the Black instruments. The instruments of the Bureau of Standards, from what I know of them, are most accurate.

Mr. Atkinson spoke of preparing cavities with their walls not parallel, but inclined toward themselves at the surface. Which way did you say the amalgam expansion occurred in the cavities?

Mr. Atkinson. It takes place principally over the free surface of the filling. It is circumscribed by the cavity walls, hence cannot be released there, except to a limited degree. The idea that amalgam, in expanding, always expands vertically, would naturally be brought to our minds by Dr. Black's statements about his tests; but the fact

is that a cube with none of its sides inclosed expands almost equally in all directions.

Dr. Woolverton. The expansion, as I understood, was at right angles to the floor of the cavity. As the result of pressure on expanding, the amalgam is forced upward at the margins, this making it lower in the center.

Another point was the size of the specimen which Dr. Black had used in testing—in diameter less than one-tenth of an inch. A test made on such a small specimen, with instruments measuring up to 200 lb. pressure, would not be as accurate as tests on larger specimens.

Another point he mentioned was the stress or pressure of the jaws in biting. Any amalgam inside the cavity receiving the pressure from the jaw is protected by the tooth, and in the sample used, less than one-tenth of an inch in diameter, the strength he required in an amalgam was about 48,000 lb. to the square inch. Most of the present-day alloys have a compression strength of 20,000 to 30,000 lb. and some as high as 50,000 lb. per square inch. It seems to me that is all the strength that is needed for any filling material.

One point I did not understand is the shrinkage of some amalgams from the cavity walls. The silver at times, without pressure, has a tendency to expand and become spheroidal. That is a point that is not clear to me. The instruments used by Dr. Black I think I saw some years ago at a dental convention. I do not know whether these are the ones at the Evans Institute or not, but it seemed to me at the time they were rather crude for doing the work they were supposed to do.

Another thing I should like to ask is concerning the growth of the amalgam crystals in the walls. Was the piece of steel placed on top loosely, or held by pressure?

Mr. Atkinson. It was forced into the cube of amalgam, but no pressure is supposed to be exerted by the hammer on the lever which moved the measuring index.

Dr. Woolverton. Is the surface of the amalgam next to the cavity wall in the same condition?

Mr. Atkinson. If the disk were held in contact with the surface of the amalgam with a stronger force than that exerted by the crystallizing—that is, the dendritic growth—the crystals would not raise the disk. I take it that in most cases there is sufficient force to prevent the crystals from opening a ditch between the amalgam and the tooth. Taking into consideration the elasticity of the dentin and the rigidity of the tooth as factors, I should think that it would be prevented. There is supposed to be no force exerted by the hammer, which rests on the surface of the cube of amalgam, so that there is nothing to keep it from lifting the disk, which would thus cause a false expansion to be indicated on the dial.

Let me give you a clearer illustration: If we slowly cool a crucible of melted alloy, we find the alloy has taken on the form of the inside of the crucible at its base, but on the surface there is likely to be dendritic growth. Therefore on the surface of the amalgam we would very likely have this dendritic growth, and that is where it would cause error in a mechanical measurement.

Dr. Frederick W. Allen. The essayist of the evening is a gentleman who has keen delight in scientific investigation. His laboratory work at his home in New Jersey, and also in this city, exemplifies this markedly. The vast amount of time spent in scientific investigations for pure love of research, without financial return, places him in the realm of the real scientific investigator.

The question of tens and hundreds of

thousands does not appeal to the average mind with any degree of clearness so I have drawn a simile that will give the relative variations in an analogous way. The highest building in the world is the Woolworth building in New York City, which is 780 ft. high. Reduced to inches, roughly speaking, that is about 10,000 in. We all know what 10,000 ft. is. Now, 10,000 in. in the air is the height represented by the Woolworth building; the difference in size between 1 in. and 1/10,000 of an inch would be as if you should place a silver quarter-dollar alongside of the Woolworth building. Bringing it down to something more personal; the diameter of a human hair is 2/1000ths of an inch, and the expression of "splitting hairs" would be applicable, for when we split the hair into twenty parts, each part would equal 1/10,000th of an inch. So you see that the differences in dimensions are quite minute.

The only thing in the paper I could take exception to is the statement in regard to the impossibility of getting accuracy of size. Many firms make small parts under conditions in which there is no tolerance of a variation of 1/10,000th of an inch. These pieces have to be manufactured, not singly, but by scores, so as to have them absolutely the right size and measurement.

I am glad that the former gentleman has spoken of the fact that there is no possibility of refuting the findings of the Bureau of Standards; such a statement represents the consensus of opinion of us all. But such data could have been stated prior to the investigations of the Bureau of Standards, for Mr. Atkinson made similar findings himself; he investigated these things, not last year, but many years prior to Mr. Stratton's investigations last January at Washington.

The question of temperature is interesting. I have seen men who were testing the dimensions of small pieces of steel, at a time when temperature was not considered. One of the pieces was found to be too small by 1/2000th of an inch, and was set to one side. The

master mechanic of the works came across it and took it in his hand for a short while, and then had the inspector measure it. His remark was, "This is one piece you discarded, but it is absolutely accurate in measurement." The temperature of his hand had been sufficient to increase the size of the piece of steel to make it the right measurement. The temperature that should be used when making the measurements is 68°F. All apparatus must be used within that temperature. Metals that stand a shock of 40,000 lb. at that temperature, if brought down to a temperature of -10°F. would break at 5000 lb. The steel that is used in our streets would not go across an ice-field ten feet in the form of sled runners. Bone runners must be used on the sleds, for you cannot use steel in the arctic regions.

One other thing that I should like to speak of is the mechanical speed at which these tests were made. If you take a piece of cast iron and place stress on it quickly, it will fracture; but if you bring the pressure on gradually and slowly, you can run it up to 40,000 lb. The accuracy in the size of the specimen is the very basis of all real investigation.

The condition of these dendrites which appear in the specimen does not signify anything. This abnormal surface should not be considered at all in mechanical stress. The stress is not put on until the amalgam is set; then it can be ground to a uniform size, which can be made specifically definite to the 100.000th of an inch. We do not need to have a micrometer to measure that. By having a block of a definite size we can make an accurate measurement. We can get standards of any shape you wish.

The question of testing is a relative matter; all these things have to be gaged, so a scientific investigation is merely a seeking after truth. If the strain, the mechanical force, and the temperature are not correct, the findings will not be truthful. Investigations should be conducted in the realm of absolute truth. This should be the same for all specimens.

Mr. Atkinson has done much for

scientific investigation, and a great deal in mechanical tests. This is a hobby of his that perhaps we can hardly appreciate, but a surprising degree of accuracy can be obtained in this research work, and the true results of the essayist will bring out the fact that we all owe a debt of gratitude to Mr. Atkinson for the work he has done in regard to this matter.

Dr. Earl C. Rice. I do not feel qualified to discuss the paper on the ground of the physical properties of amalgams or dental alloys, or the measurements of their expansion. I know very little about these. What I do know I learned from my friend Mr. Atkinson. He has been a strong advocate of the use of high silver in alloys. It is not my intention to discuss the problems before you, but to bring out something about the proper working of these alloys for the best obtainable results.

It has been said that it does not make any difference how much mercury you put in an alloy, in order to get a good result, provided that the mercury is afterward removed. I am not in accord with that statement at all. It has been my experience that the more nearly you adhere to a careful weighing of alloys, including mercury, placing the mercury in in a slight excess, the better it will be. This excess must afterward be removed. A good alloy can be ruined by over-working or by under-working. If the alloy is triturated until it becomes absolutely smooth, not showing a particle of granulation, it has been ruined, and should not be placed in the cavity. In my experience I think I have proved to myself—and the work coming back after a considerable period of time shows that I must have been right, in a measure, in my belief—that the proper working of an alloy is to place a definite amount of mercury with a definite amount of alloy. In doing this I measure the mercury and alloy, and place them in capsules, one containing the mercury and the other the alloy. When the mercury and alloy have been mixed until the amalgam attains what I consider the proper homogeneity, it is placed in the cavity and

packed. I always use a good quantity, never squeezing the alloy dry. One-half is squeezed relatively dry, and the other half is placed in the cavity with the mercury still remaining in it. The alloy is now packed in the cavity. I then pick up the dry alloy, and with it absorb the excess of mercury. It must be borne in mind that if too much mercury is left on the surface it will diffuse itself equally throughout the entirety of the filling, and we shall have a bad, weak filling.

Now I would say something regarding the cavity preparation for the successful use of an amalgam. I believe that dental amalgam is the greatest material for building up teeth. We have passed through the period when we used to laboriously plug gold into the teeth. I have seen fillings that had been put in by the pioneers, and had remained for forty or fifty years; and they were good still. That is all right for the expert, but in the hands of the average operator amalgam is a great tooth-saver.

I believe that its use should be governed by definite principles. For instance, fillings should not be retained in cavities by means of grooves; the days of grooves have passed. Nothing will destroy an otherwise good and well-placed alloy filling so much as the groove for its retention, as this interferes with its equal expansion. In my opinion, all walls should be flat. The shape of a cavity should be like that of a truncated cone with the base downward and the small end toward the surface on which pressure is to be brought. The expansion is equal in all directions. Therefore a filling that has been badly placed in a properly prepared cavity should be, after expansion has taken place, a reasonably good filling. I believe success is largely dependent upon the finishing of the alloy filling after expansion has occurred. I think the finishing should be done a considerable length of time afterward, when expansion has had time to take place.

Dr. D. A. Zurbrigg, Milford, Del. There have been a great many things said tonight that are quite true, along

with some with which I cannot quite agree.

First, I think that we should thank Mr. Atkinson for not hesitating to criticize some of Dr. Black's work. If you have ever been in Chicago, you will know that one's life is scarcely safe there if anything is said against that work.

I was interested to hear that Mr. Atkinson disapproves of the instruments used by Dr. Black, as not being up to date. They have, for very valid reasons, been discarded at our laboratory fully three years ago. The instruments used today, designed and to a large extent built in our own department of physical research, are instruments that far surpass anything Dr. Black ever used or knew of.

Dr. Black's micrometer is not at all mechanically accurate, and will not give accurate repeat records. Its readings are also too easily influenced by different men's operation, although not nearly so much as is the case with his dynamometer. This latter instrument is really nothing more nor less than a testing machine, recording your ability or my ability to put in a hard, well-condensed filling.

Dr. Black also used testing cubes entirely too small, probably because he previously had tested the crushing strength of dentin, and 85/1000th in. cubes were the largest pieces of dentin he could cut from a human tooth. Amalgam in such small cubes gives wrong readings in the dynamometer tests for crushing strength. Cubes should be used of a size—certainly of a proportion, diameter to height—that physicists have determined as correct. In our laboratory cylinders are used which are one centimeter in diameter and not less than that in height, the height after compression (packing) depending of course on the alloy used and the packing force.

This data is contained in a paper which antedates the report of the Bureau of Standards mentioned by Mr. Atkinson, by possibly six months. This earlier paper by Dr. Gray was given at a meeting of the American Institute of Mining Engineers in Milwaukee, October 1918.

The paper was written more from the general than the dental standpoint, and gives in condensed form the results of three years' work on amalgam and dental alloys. The paper is being reprinted in the *Journal of the National Dental Association*, the first instalment appearing in the June issue. In it you will find illustrations of the apparatus used and many charts representing results.

The question of temperature control is a serious point that Dr. Black absolutely missed. It is of the greatest influence on correct deductions in all metal tests.

For accurate comparative tests between different alloys and their amalgams a standard routine must be devised and adopted. First of all, you must decide on the size of the cylinder. With one only two or three millimeters in height you get a wrong impression, because the jaws of the crushing machine support the amalgam, and the high crushing strength so obtained would be wrongly attributed to the amalgam under test. Such a cylinder test must also be made with a definite amount of alloy and a definite amount of mercury, so that all tests may be made under similar conditions. Trituration must be continued for a definite time, and in a mortar or amalgamating appliance of a definite temperature. The packing load must be uniform for each series and applied at a definite speed. The cylinders so formed must be kept in an incubator at a definite temperature until tested, and then crushed at a definitely controlled temperature, which in our laboratory has been that of 37.5°C. (body temperature). The contraction sometimes noticed in fillings in the mouth, I do not think we can always attribute to the amalgam. If some seeming contraction does show, it is more often due to the failure of either the margin of the alloy or the margin of the enamel.

Excess of mercury for amalgamation is not a bad feature. It does not upset the "balance" of the alloy, a term we have heard so often in years gone by. There is abundant reason to believe that

in Dr. Black's time it was necessary, and in small-quantity production is today necessary to "balance" dental alloys. Dr. Black bought five or ten ounces of silver, tin, and other metals, at any place he could get them. Naturally, these varied in purity and behavior, and it was necessary to "adjust" or "balance" them. That necessity does not obtain today, and it has become merely an advertising dodge. The original necessity for it has been eliminated; today we obtain metals so pure that they do not need balancing. The metals are individually tested, of course, to determine their chemical fitness for dental alloy purposes.

Reference was made to zinc. I think we all know that the most prominent alloys on the market today, the alloys which give us the best service, contain zinc. I am quite sure they will continue to contain it, for reasons quite sufficient to their makers, despite the frantic efforts of various interests to discredit zinc-formula dental alloys. These reasons will be given publicity in due time, and will undoubtedly check or discourage future false advertising statements and claims.

The alloy question is a large one. We have been working on it for fully four years and it is far from completed.

Mr. Atkinson (closing the discussion). I have been very much interested indeed in the variety of comments that have been made upon this paper, and also in the statements made concerning the practical phase of amalgam filling. I was interested in Dr. Woolverton's statement regarding the proportionate stress that the jaws exert. His point, as I take it, is that on a space one-tenth of an inch square, if 100 lb. were the amount of stress per square inch, that whole pressure would be exerted in the biting of the jaw, but that it would take in the whole surface of the tooth and would not be confined solely to the surface of the filling. Is that correct, Dr. Woolverton?

Dr. Woolverton. That is what I meant.

Mr. Atkinson. Dr. Woolverton also stated that he could not understand the

bulging of the amalgam from the cavity, and the setting up of a ditch or space around it. That subject was treated in the "American System of Dentistry," many years ago, before Black wrote on the subject of amalgams, and it was spoken of as a tendency toward spheroiding—that is, the natural tendency of a fluid body to assume a spheroidal form. Remember that an amalgam filling is not completely inclosed by the tooth cavity. There is always an open side, where such a change can take place, and we must consider the fact that in the old days the cavities were largely in the form of a hollow sphere, a natural result of the use of round engine burs. Thus the shape of the cavity itself aided spheroiding, and at the same time the amalgams were of a plastic character, containing as a rule a high percentage of tin. They were therefore more fluid or plastic, hence more sensitive to the operation of the law governing spheroiding than would be the amalgams that are accepted today. These do not change form so easily, and such spheroiding as takes place, as may be evidenced by an advance over the surface of the center of a filling, takes place very slowly. As the filling takes a spheroidal form it bulges from the top of the cavity and draws away from the sides. There are those whose opinions differ upon this point, but I have test plugs of amalgam which so plainly show spheroiding that it may be perceived by the naked eye.

Dr. Woolverton. I was speaking of the fact that during the two months I used alloys from a certain firm, the firm changed hands. They advertised a gold alloy. I tested it for gold, and there was none in it. In one mouth in which I remember using it the fillings were in cervical cavities, and had bulged one-thirty-second of an inch and had shrunk away from the walls.

Mr. Atkinson. The particular alloy that Dr. Woolverton refers to was said to contain 6 per cent. of zinc and the changes of form were due to the presence of that metal. In testing for the effects of zinc in dental amalgam alloys, I cannot understand why dental experi-

menters have not gone into the question of just what effect a *large* percentage of zinc has upon an alloy, by introducing it in such ratio that its *full* effect on the alloy can be at once seen in the test; its proportional effect might easily be thus deduced. Theoretically Zn is +, that is, electro-positive, to all the other metals in a dental amalgam, and reacts with the oral fluids; the greater volume of the salts so formed increases the *bulk* of the filling. Also, zinc combined with mercury reacts to form a low-melting eutectic, which has a freezing-point of one degree centigrade below the freezing-point of mercury. It can never harden at mouth temperature, and the filling containing zinc that is not appropriated completely by the other materials is bound to change form. We cannot change the laws that govern the reactions within dental amalgam, nor alter the resultant physical properties. It matters not by what means we attempt to overcome the law, the law operates. These fillings change form because of the law that underlies all the setting and subsequent volume changes in an amalgam, which volume change is accentuated by Zn.

I was very much interested in the statement that Dr. Woolverton had seen the G. V. Black testing instruments at a dental meeting a number of years ago, and considered them crude—which of course they are. To the trained physicist, the Black micrometer and dynamometer are not "precision" instruments.

Dr. Allen gave some good illustrations of the relative size of 1/10,000 of an inch. When we say the 1,000,000th of an inch, I doubt whether even the physicist, without reference to known length, can form any conception of such a short length. For instance, when I said it had been determined at the Bureau of Standards that there are 28 microns of expansion or contraction per degree centigrade for amalgams per meter, we must remember that the meter is 39.47 in. in length, and that a micron is 1/25,000th of an inch; so there is a change of only 28/25,000 in. per one degree centigrade.

That would be represented as a coefficient of approximately 27,000,000ths, basing it on 1,000,000 microns to the meter; and when we consider the fact that all these measurements are for the purpose of producing a material that will seal the cavity against the ingress of bacteria, and then consider that the bacteria of decay are, according to the bacteriologist, only $1/7$ of a micron, we see how impossible it is to get a mechanical measuring instrument that will protect the tooth against that particular bacterium. It is incomprehensible; and I think Dr. Allen would have to come down to a ten-cent piece, instead of a quarter, in comparison with the Woolworth building, in comparing so small a dimension as the micron with a known length.

Dr. Allen takes exception to my statement regarding the inability of measuring $1/10,000$ in. mechanically. My point was not in reference to the accurate duplication of machine parts, but that it is practically impossible to *accurately, invariably, and repeatedly* measure plus and minus variations of $1/10,000$ in. or $1/20,000$ in. by mechanical means, as was claimed by Dr. Black, more particularly under the conditions that obtained in his amalgam tests.

That calibrating disks of infinite accuracy *can* be made, just as, for instance, certain delicate parts of a chronometer *are* made, is fully recognized, else the calibration of various types of testing machines to determine their accuracy and sensitivity would be out of the question, and we would not now be discussing a report which so convincingly reveals the limitations of the G. V. Black testing apparatus—upon the accuracy of which latter many of his conclusions must either stand or fall.

In a paper by Frederick J. Schlink, associate physicist, Bureau of Standards, "Variance of Measuring Instruments, and Its Relation to Accuracy and Sensitivity." Bureau of Standards bulletin No. 328, September 30, 1918, several factors affecting the accuracy and sensitivity of mechanical measuring devices are discussed. The effects of friction,

molecular hysteresis, the human equation, and the "normally uncontrollable variations in the manner, frequency, and rate of operation," as shown in this paper, clearly sustain my point. Only the interferometer can approximate the degree of accuracy necessary to measure the length or other dimensions upon which to base our experiments in producing an amalgam that will absolutely seal a cavity against the ingress of the infinitesimally small bacteria of decay.

Now, Dr. Allen is correct as to the dendrites not being important in compressive strength tests. They are not, because they would be crushed in the test or may be planed from the surface and neglected as a factor. The reference was to the effect of dendrites upon the accuracy of volume tests as made on the G. V. Black micrometer.

Dr. Rice, of course, has made several statements with which I am in entire accord.

Dr. Allen is an expert upon the question of measurements. For four years he was in charge of the physical testing laboratory of the Cramps' Shipbuilding Co. Dr. Rice is considered an expert in amalgam fillings, and when he states that an excess of mercury will interfere with the usefulness of a dental amalgam, and that it will tend to diffuse throughout an amalgam filling, he is right; but this process does not necessarily take place in five minutes, five days, or five weeks. It takes place slowly and gradually, but it takes place. "Diffusion" is a factor with which we have to contend, and an excess of mercury that is not properly removed from an amalgam will ruin the filling. If that excess of mercury, by the pressure of an amalgam plugger on the center of the filling, produces an excess at the edges, the mercury will, when the pressure is relieved, slowly sag back to the center. The effort of the mercury is to get into complete diffusion in the amalgam; so I am sure, in spite of Dr. Zurbrigg's challenge on that point, that Dr. Rice is correct.

Dr. Rice described the correct shape of the tooth cavity as that of a truncated cone, and I am certainly in accord with

his position. As I stated in my paper, the expansion that takes place in amalgam fillings has its principal expression over the free surface of the filling, but if circumscribed by an inward sloping of the walls of the cavity (by a truncated cone, in other words) utilizes the general expansion, and so seals the cavity against the ingress of bacteria. I have seen that in practice and verified it by tests, and therefore, am sure Dr. Rice has the correct idea.

Dr. Zurbrigg agrees with my statements concerning the G. V. Black dynamometer. For seven years I have been making the statement that the Black method of testing and making dental amalgam alloys is wrong, because the conclusions upon which it is based were reached from tests made with imperfect instruments, and the changes and variations found in amalgams of varying formulæ and varying percentages of this and that metal that he balanced against some other metal were variations in the instruments themselves! It was not the amalgam that varied, but the micrometer. It is not necessary to use instruments for a determination of that kind. Facts like that can be deduced upon purely theoretical grounds, if the physics of the question be properly studied. However, I have verified my deductions—so that they are not, in the final analysis, pure theory.

The interferometer methods, as used at the Bureau of Standards, mean that they are measuring the expansion or any other movement in an amalgam by means of light interference. They can measure a difference of 1,000,000th of an inch. The measurements are based on the interference of light waves whose lengths are known. Therefore the tests are infinitely accurate—more accurate than any other means of measurement. That is correct, Dr. Zurbrigg, is it not?

Dr. Zurbrigg. Not exactly.

Mr. Atkinson. Well, what is?

Dr. Zurbrigg. A prior and quite as accurate an apparatus, if not more so, is the dilatometer used in our laboratory. This instrument is described in the aforementioned *Journal of the National Den-*

tal Association for June 1919. The interferometer method uses light-wave interference as the basis of measurement. We have such an instrument in our laboratory as a curiosity—perhaps merely to show we are familiar with the instrument—but we prefer not to use it in this work.

Mr. Atkinson. Then my point is conceded?

Dr. Zurbrigg. If by that you mean that the interferometer method is the most accurate one, you are wrong. As said a moment ago, we believe the dilatometer designed by our physicist for *this special amalgam investigation* to be the preferable instrument. Our everyday working measurements are down to a 500,000th of an inch. The instrument is pictured and briefly described in the paper already mentioned. There is no secret about it.

Mr. Atkinson. There should not be. There has been too much secrecy.

Dr. Allen. While this has been done with very elaborate apparatus, quite the same thing may be seen by the use of the tallow candle and the sheet. The reflection of the image on the sheet will give the reading as accurately as the ten-thousand dollar outfit just referred to. I have made readings in that way that were the same as those made with that apparatus.

Mr. Atkinson. I am thoroughly convinced that what Dr. Zurbrigg has said about uniformity in the amounts of mercury and alloy and about the methods of handling these during the test is absolutely correct, and I would carry this idea of uniformity even farther, for it is also necessary in the manipulation of dental amalgams; and the sooner dentists recognize that fact the better it will be for their amalgam fillings.

In reference to the development of 56,000 lb. of compressive strength in some amalgams, I would say this is quite within the realm of possibility—but under a pressure that cannot be exerted in placing a filling in a tooth. The plug employed in those tests was a solid cylinder 1 centimeter in diameter, and

was packed into the mold under a pressure of 400 kilograms, that is, 880 lb. avoirdupois. How high pressures have been used, Dr. Zurbrigg?

Dr. Zurbrigg. Up to 2000 kilos.

Mr. Atkinson. Four hundred kilos was the lowest pressure used, was it not?

Dr. Zurbrigg. No; 100 and even as low as 25 kilos.

Mr. Atkinson. At higher pressures, higher compressive strengths result; and at lower pressures, slightly lower. Four hundred kilos packing pressure results in what crushing strength?

Dr. Zurbrigg. Fifty-six thousand pounds per square inch of amalgam.

Mr. Atkinson. The compression of an amalgam into a mold by mechanical means for testing does not give us results for comparison with those we can obtain in placing a filling in a tooth. We know that no human tooth would stand the pressure, and no dentist would be capable of exerting it at one time over a tooth—it is not within the realm of possibility; so the only tests that are of value to dentists are those made with the materials in common use, at working temperatures and working pressures. Aside from that, the tests have academic but not practical values. I thank you.

Dr. Zurbrigg. May I add one word in explanation? Four hundred kilos, applied on a surface 1 cm. in diameter, translated into everyday work, means about 8 or 9 lb., using a packing instrument face of 1 mm. diameter; 141 kilos pressure corresponds to 2 to 3 lb. hand pressure, quite within any dentist's ability and any patient's resistance to withstand. It is as near actual mouth conditions as they can be approached in any laboratory. We ask every dentist visiting us to make a record of his average packing procedure on an apparatus specially designed for this purpose. We have him put in an actual filling; and the apparatus records every pressure he uses. One man may use 8 or 9 lb. pressure on a small packer, and a good amalgam filling results, while another man probably uses very little force, with a correspondingly weak filling and low crushing

strength. The fault is not in the alloy, but in the man who uses it.

In spite of all that has been said against the use of an excess of mercury in amalgamation, I repeat that our investigations prove that you may use all you like, but couple with it the proviso that *you must get rid of this excess either immediately before or during the packing of the alloy into the cavity.* It makes amalgamation easier, more thorough, and the alloy easier to work, and, with the thorough packing so possible, makes a stronger filling. Copper amalgam crushes at about the same point as the low-in-silver alloys—the alloys containing a large percentage of tin.

Mr. Atkinson. I thought that I had closed the discussion, but I must rise to say that, although Dr. Zurbrigg may be convinced that his statement is correct, I am not. Because, if you place or superimpose a packing pressure of 880 lb. or 400 kilos on a solid cylinder one centimeter in diameter, it must be remembered that this cylinder is completely inclosed in a steel mold capable of withstanding a pressure that it is impossible to apply in dental practice. In order to secure that degree of pressure upon a filling it would be necessary for the dentist to place a mechanical appliance over the tooth, and then use all the force it is capable of, and more than the jaw or the tooth could stand. If we exert a pressure of nine pounds over either a square millimeter or two square millimeters, all the amalgam around the instrument that is being used to compress the amalgam beneath it is simply pushed out of the way. It is not a general compression over the entire area of the filling, but only a compression over a small part of it; and this is not a correct standard by which to judge how much pressure may be placed over the entire surface. It is not a fair test.

This closed the scientific business of the evening.

On motion of Dr. ALLEN, a vote of thanks was extended to the essayist for his elaborate paper.

Meeting adjourned at 11 P.M.

A TRIBUTE TO
Dr. James McManus
HARTFORD, CONN.

On His 83d Birthday
July 16, 1919

As one who, at the close of day,
When cares have ceased with set of sun,
Rests by his long and arduous way
And contemplates his work well done,

So, in life's quiet eventide—
So, harbored where the wind is stilled,
Your freighted years at anchor ride
Like treasure ships with service filled.

For life is counted not in years,
Nor gathered baubles that we boast;
Still falls the mandate on our ears,
"He lives the best who serves the most."

So through thy lengthening days hast thou
Full well the lesson deeply learned,
While Time hath lightly touched thy brow,
Adorned with honors richly earned.

Thou art not old, save in the deeds
That line thy more than fourscore span
Of ministry to others' needs,
Of service to thy fellow man;—

Nay, thou art young in heart and mind,
With interest still that never tires
In all affairs of human kind,
In life and hopes and great desires!

So now we come, from various ways,
That we our loyalty may prove;
Accept this feeble gift of praise—
This simple tribute of our love.

J. WARREN HARPER.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDWARD C. KIRK, D.D.S., Sc.D., LL.D., *Editor.*

L. PIERCE ANTHONY, D.D.S., *Associate Editor.*

PUBLISHED BY THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Virgin Islands, Cuba, and Mexico. Canada, \$1.40. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the EDITOR, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, SEPTEMBER 1919.

EDITORIAL DEPARTMENT

Dentistry for the Masses.

SOCIAL movements which are justified by public necessity usually develop by a series of impulses which are cumulative in effect, and they often establish themselves as the result of some final crisis which compels recognition of their importance.

A generation ago, W. D. Miller published his investigations of the human mouth as a focus of infection, by which he scientifically established two fundamental facts: First, that the human mouth is the habitat and breeding-ground of a large group of micro-organisms, a great proportion of which are pathogenic; and second, that organisms originating in the oral cavity may be carried to other parts of the body and thus set up disease in organs and

tissues remote from the oral cavity. He further showed that septicemia may result from the absorption of toxins produced by bacterial activity in the mouth.

These pioneer researches, notwithstanding their far-reaching significance, were practically ignored, except as being interesting scientific observations, until Hunter in 1910 (see DENTAL COSMOS, July 1918, page 585) presented the same problem from the standpoint of his clinical studies, and drew attention to the havoc that was being wrought to human health and efficiency by diseased teeth, and more particularly by ignorantly conceived and badly constructed dental prosthetic restorations. Both of these classic communications gave force and substance to the so-called Oral Hygiene movement as a practical application to the preservation of the public health and prevention of disease, based on these known facts regarding mouth infection.

Statistics soon became available which demonstrated beyond reasonable doubt that a sound body is in large degree dependent upon wholesome mouth conditions; and, concomitantly, the far-reaching importance of the relation of specific mouth disorders to obscure lesions of the vital organs, the special sense organs, diseases of the nervous system, etc., has been gradually unfolded by various investigations, until today the belief in the dental origin of disease is flourishing with an exuberance that is suggestive of hysteria. And then came the world war, which has added what ought to be the final demonstration, if any were needed, that proves the necessity for a healthy mouth and teeth as an insurance against bodily disease.

Military medical records of all nations furnish convincing evidence of the direct relation between sound teeth and the physical efficiency of the fighting men. Our Government practically recognized this in the creation and equipment of the largest and most efficient army and navy dental service of any of the belligerents, and further emphasized its recognition of the vital importance of oral hygiene by providing for the instruction of its military forces in the personal hygienic care of the mouth.

These several influences, which have been operating more or less actively during the past generation, have now reached a critical stage of development. The cumulative effect of the several activities here referred to has been to place dental service in an

entirely new position; that is to say, it can no longer be properly regarded as a luxury to be enjoyed exclusively by the rich and well-to-do—for, as a matter of fact the verity of which is supported by incontestable evidence, it is a vital necessity for the maintenance of public health. Because of existing conditions, because a physically sound citizenry is essential to the national welfare, because good health is fundamental in its relation to our national progress, our national well-being, and our national defense, and because sound teeth in a healthy mouth are essential to the physical welfare of our people, the dogma that dentistry is a luxury is indicative of a policy and mental attitude both limited in scope and selfish in conception, for which reasons alone it is untenable. The benefits of dental service must be made accessible to all the people in the same measure that the benefits of all phases of the healing art have been made generally accessible.

It is undoubtedly true that a certain type of dental service is a luxury, and that even that type must and doubtless does embody the highest ideals of health-conservation and disease-prevention; but it is also coupled with a luxurious ideal upon the part of those who demand, as well as those who render that type of service; and it is just that element—the demand for the luxurious, and the acquisitiveness of those who cater to it—that obscures the problem of bringing a health-promoting dental service within the reach of the rank and file of humanity.

It is an economic as well as a humanitarian problem. The cost of bringing good, serviceable dental care to children of school age, the expense of whose education is borne by the taxpayer, is shown by reliable statistics to be somewhere around one dollar per annum per capita. The amount varies more or less according to circumstances. The cost of doing this humanitarian work is insignificant as compared with the price which we are now indirectly paying for not doing it, in doctor's bills, in the price we pay for re-education of mentally retarded children, in supporting institutions for defectives, and above all in the loss of physical efficiency in the manpower of the nation which oral infection entails. Collectively the dental profession, to its credit be it said, has promptly responded in full measure to every reasonable demand that has been made upon it. When the light of truth has made the path clear the dental profession has followed it. Everything now points to the

democratization of dental service. In England it has been made a national question as a feature of the public health service.

The problem involves many details, among which are—

A greatly increased number of dentists.

Legalization, in all of the states, of the work of the dental hygienist, as it is now legalized in fifteen states.

Reorganization of the dental educational curriculum in recognition of the fact that educational provision should be made for two classes of dentists—(a) those who are to intelligently and adequately serve the public, and (b) those who are being educated as teachers and researchers.

The enactment of the state legislation which will make dental service an integral part of the public health activities of each state, under the administration of dentally educated executive officers.

The introduction into the public school curricula of obligatory education in oral hygiene.

The systematic oral inspection of school children and treatment of their dental defects by dentists.

The convincing argument in favor of such a departure is the economic one that it will pay, and pay well, to do it; for the cost is relatively small and the returns large. That the cost is small becomes evident when we rid our minds of the obsession that "Dentistry is a luxury." Luxurious dentistry is undoubtedly costly, but dentistry for the attainment of oral hygiene is not necessarily so.

In 1910, the late Dr. Percy B. McCullough set forth in a communication to the Academy of Stomatology the details of a system of dental service which he had put into successful practice at the dental dispensary of the department of Health and Charities in Philadelphia. In principle this plan had for its objective the securing of hygienic mouth conditions for the greatest number of school children at the least cost to the taxpayer, and the results obtained demonstrated the soundness of the plan. In detail it would be modified today, but in principle, and so far as its ultimate objectives are concerned, it was a successful pioneer effort in the direction here under consideration, and which is now in an acute stage awaiting practical solution. The world is now grappling

with the problems of reconstruction. One of the greatest of these is the demand of the masses for improvement in living conditions, and all measures for the promotion of better general health are being actively pushed forward for consideration.

The problem of the dental profession in the activities of reconstruction is and will continue to be the carrying of dental service to the masses as a public health measure. It is fully time to set about it.

Vanderbilt University School of Dentistry.

IN our August issue we published an announcement of the closing of the School of Dentistry of Vanderbilt University. We are very glad at this time to announce to the profession that plans have been perfected whereby the Board of Trust of the University has authorized the reopening and reorganization of the School of Dentistry, and that it will continue its sessions under the deanship of Dr. R. BOYD BOGLE.

A Correction.

WE published in our August issue a list of the graduates of the Medical Department of Columbia University as the graduating class of the Dental Department. This was an error on our part which we take this opportunity to correct.

PRACTICAL HINTS

This Department specially welcomes the brief presentation by our readers of any novel suggestions or methods which in their own practice have proved to be time-saving or to possess other features of advantage.

Benzoic Acid a Valuable Antiseptic and Devitalizer of Bacteria.

By **GEORGE J. BLEECHER, D.D.S., Philadelphia, Pa.**

MUCH has been written upon the antiseptic and germicidal value of certain official preparations and drugs. In dental materia medica there have now come to the front such recognized preparations as the Carrel-Dakin solution, dichloramin-T, chlorazene (Abbott), and similar products.

It remains to be seen just how long this important and necessary product, dichloramin-T, will stand alone as an antiseptic, as a destroyer of the zymogenic organisms, and as a continuing disinfectant. Many practitioners are very enthusiastic over the results they have so far obtained with it, and have made it an essential part of their armamentarium, employing it in the treatment of root-canals, in pyorrhea, and as an antiseptic mouthwash.

There was a time when mercury bichlorid and carbolic acid were lauded very highly. Later, certain disadvantages were found concerning both of these germicidal agents, and some surgeons and dental practitioners discarded them for other medicaments. Sir

Joseph Lister, one of the valiant soldiers of scientific research, at one time an advocate of carbolic acid, altered his opinion and employed mercury bichlorid solution, only to come back to the old reliable carbolic acid in spite of the fact that it possessed escharotic properties.

There are times in our practice when the duration of time is an important factor and we must secure quick results, either in treating root-canals or using a mouthwash for an infected area.

The value of benzoic acid as an efficient and prompt antiseptic and devitalizer of bacteria seems to have been overlooked. Miller long ago called our attention to this product. A 1 to 100 solution of benzoic acid will devitalize bacteria in less than one minute. We can appreciate the value of employing a drug that requires so short a time to produce the desired results, so far as a mouthwash is concerned, when it is remembered that the average patient will not retain a solution in the mouth more than one minute, and I doubt if that long.

For carbolic acid (1 per cent. solution) to produce the same results as benzoic acid, it would require anywhere from ten to fifteen minutes; consequently, it is practically useless to employ it in mouthwashes, unless for the purpose of arresting or destroying living micro-organisms in the solution, or for its anesthetic properties.

Benzoic acid is effective as a dressing for root-canals, made by dissolving powdered benzoic acid in camphorated oil, or any of the essential oils, to the extent of 1 per cent. As an ingredient in mouthwashes it can be combined with thymol and the essential oils as follows:

Modified benzoic acid solution.

R—Acidi benzoici	5ij
Thymolis	℥x
Ol. cassiæ	
Ol. gaultheriæ	aa ℥v
Mentholis	℥x
Acidi borici	3j
Alcoholis	flʒijss
Aquæ dest. q.s.	Oj

Glycerin or simple syrup may be added sufficient to sweeten, and the solution should be diluted 1/2 in water before using. Personally, I have secured very excellent results with the above formula in the treatment of pyorrhea and in all suppurative conditions about the mouth.

1700 N. 42D ST.

Removal of Redundant Gum Tissue Prior to Insertion of Full Upper and Lower Dentures.

By PHIL L. SCHWARTZ, D.D.S., New Brunswick, N. J.

THE following *résumé* of a case may serve to illustrate the necessity of a solid foundation for satisfactory results in plate work. Patient, female, age fifty. Examination showed a large portion of redundant gum tissue extending over the anterior ridge of the maxilla from about cuspid to cuspid region. She had been wearing a full upper denture for a number of years which proved extremely unsatisfactory due to the abnormal growth present. Upon masticating, excessive rocking of the denture was produced, causing much discomfort.

Operation. The local area was first anesthetized using 1.5 to 2 per cent. novocain-adrenalin solution. Both submucous and subperiosteal injections were used. After thorough infiltration, a semilunar incision directed superiorly,

covering the extent of the growth, was made through the mucosa, submucosa, and periosteum, extending over the anterior surface of the ridge, care being taken not to excise the frenum labiæ. A semilunar incision directed inferiorly was then made upon the lingual surface of the ridge extending well through the periosteum. The growth was grasped with hemostats and carefully dissected away. The site was thoroughly sponged and the bleeding controlled. A periosteal elevator was inserted under both flaps and the muco-periosteum slightly elevated on either side. The wound was again carefully sponged and the flaps brought together, using fine suturing silk with a continuous suture. The area was then covered with a small double thickness of iodoform gauze. The gauze was

changed two or three times daily. At the end of the third or fourth day perfect union had taken place, and the sutures were removed.

After such an operation an impression

may be taken and dentures constructed. Upon completion perfect adaptation will be present and satisfactory results are bound to follow.

339 GEORGE ST.

REVIEW OF CURRENT DENTAL LITERATURE

[*Harvard African Studies*. I. Cambridge. U. S. A., 1917. *Varia Africana*, I, pp. 29-32.]

Oral Surgery in Egypt During the Old Empire. By E. A. HOOTON.

In the September 1917 issue of the *Journal of the Allied Dental Societies* [for abstract see DENTAL COSMOS, November 1917, p. 1162] K. H. Thoma reported on oral diseases of ancient nations and tribes. On p. 328, he wrote, "One of the jaws which belonged to an individual of the Middle Empire shows, however, what perhaps may be an evidence of surgical treatment of an alveolar abscess, and will be described later." Figs. 5, 6, and 7 of Thoma's article refer to this specimen, which likewise forms the basis of Hooton's discussion. In Thoma's description the mandible is referred to the Middle Empire (2200-2000 B.C.), in Hooton's to the Old Empire (2500-2200 B.C.). Hooton's decision is probably to be accepted as the more authoritative, and he accords to Thoma full credit for the discovery of this instance of oral surgery. The mandible (Peabody Museum, cat. No. 59,303) belonged to a fragmentary skeleton from an Old Empire tomb at Giza. The jaw is that of a middle-aged male. Externally there is no evidence of alveolar abscess except two holes in the buccal surface of the right side of the mandible, one between the roots of the second premolar and first molar and a little above the level of the mental foramen, the other at a slightly higher level between the roots of the first molar. Radiograph clearly indicates an abscess in the body of the mandible

in the region of the holes. Fortunately the right ramus was broken, so that the infected area was revealed when the mended specimen was taken apart.

The teeth are all much worn. The first molars show most wear, and in the right a small channel leading to the pulp cavity has been exposed. Doubtless this exposure gave rise to the abscess about the roots of the first molar. The two holes in the buccal surface of the horizontal ramus communicate with the cavity in the alveolar process, arising from absorption of tissue, stimulated by the infection. The one hole is between the roots of the second premolar and first molar, 20 mm. above the lower border of the jaw, measuring from the lower border of the hole. The other hole is between the roots of the first molar, 22 mm. above the lower border of the jaw. The two holes are 3 mm. apart. Each is round and 2.5 mm. in diameter. The posterior hole is surrounded by a circular depressed area, showing evidence of absorption. Hooton suggests the following explanation: When the individual was suffering from the abscess an attempt was first made to relieve it by boring the anterior hole between the premolar and molar. This hole was bored downward from an angle of about 15° with the sagittal plane. The result was a cleanly cut, round hole, which passes downward through sound tissue, and taps the lower anterior border of the abscess, but in such a way that the pus could not have drained out through this hole. As this measure was ineffective, another hole was bored a little higher up and farther back, between the roots of the first molar.

This penetrated the middle of the abscess, and the pus discharging absorbed some of the tissue of the walls of the hole, and spreading out, infected a certain area about the aperture, making the circular depression to which reference has been made.

Neither of these holes could have been the result of the abscess eating its way naturally through the lateral wall of the alveolar process and so discharging, because (a) the direction of the holes is upward, at an angle of about 15° from the vertical, and not horizontal, as it would be in case of pathological absorption; (b) the abscess has not eaten its way through the alveolar process, because the anterior boring goes through a thickness of 2.5 mm. of sound tissue before reaching the infected area, and the posterior hole passes through 3 mm. of sound tissue. Moreover, there is perfectly sound tissue between the external surface of the alveolar process, where some absorption has occurred from the discharging pus, and the main abscess, although the walls of the second boring, through which the pus discharged, show absorption.

It seems most unlikely that the anterior hole could be a supernumerary mental foramen, because Hooton has not been able to find any instance in which the supernumerary mental foramen attained any such size as does the anterior hole in this specimen, which has a greater diameter than the mental foramen. The anterior hole is a perfectly round, cleanly drilled hole, with sharp edges, whereas usually the edges of the foramen are rounded. Finally, it would be extremely remarkable to find a supernumerary foramen bearing the precise relation to an alveolar abscess that is seen in the case of this hole.

The evidence of this specimen seems to establish beyond a reasonable doubt the existence of a rudimentary knowledge of oral surgery in the Old Empire.

[*Harvard African Studies*. II. 1918. *Varia Africana* II, pp. 101-4.

Note on a Deformed Skull from Siwash Oasis. BY E. A. HOOTON.

The skull (Peabody Museum, No. 58,723) was that of a middle-aged individual, probably male. A general idea of the deformity may be obtained from the following description: An enormously long and narrow head, face retreating under bulging brow, the angles of

the jaw about on the level with the lobules of the ears. The oral aspects and alterations in masticatory function are both considerable and interesting.

The suborbital fossæ are pronounced, partially because of the deflation of the maxillary sinus from loss of several premolars and molars. There is very slight alveolar prognathism of the upper jaw, though that of the lower is pronounced. The dentition is complete, with the exception of a first incisor, but the quality is very poor. The maxillary right third molar and the left second and third molars have been lost during life, and the alveolar processes indicate that the decay of these teeth resulted in alveolar abscesses. The left first molar has an enormous cavity. The left canine and both second incisors are mere decayed stumps. It seems that the maxillary right first incisor never erupted (apparently Hooton had no roentgenogram made).

In the mandible, all right molars lost, with accompanying abscesses; left second and third molars lost in life. Several other teeth are carious. The second incisors are laterally compressed and pointed. All of the teeth remaining, except the mandibular first incisors, are much worn. The palate is U-shaped. The entire facial skeleton is bent back beneath the frontal region, so that the roof of the palate and the alveolar arcade slope sharply backward and upward. This seems to have been due to a premature ossification of the basisphenoidal suture and to the disarticulation of the mandible. Owing to this (permanent) disarticulation, new glenoid fossæ have been formed in the temporal bones mesialward from the anterior portions of the roots of the zygomatic processes. These are deep depressions with their long axes directed antero-posteriorly, corresponding to the shape of the atrophied mandibular condyles. In the normal positions there are no glenoid fossæ whatsoever. In the mandible the condyles are reduced to atrophied stumps, 13-14 mm. in antero-posterior diameter, and 3-5 mm. in lateral diameter. The articular surfaces are below the level of the deepest points in the sigmoid notches. On the other hand, the coronoid processes with the attachments for the temporal muscles are well developed, as are also the attachments of the pterygoid muscles. Whereas the symphyseal height of the mandible is 32 mm., the minimum height of the

horizontal ramus at the root of the coronoid process is only 13 mm. on the left and 15 mm. on the right side. The lower border of the horizontal ramus is sharply concave at this point. The mental eminence is well developed, but is masked by an excessive alveolar prognathism.

This skull is a remarkable example of the ability of the human body to adapt itself to abnormal functional conditions. Evidently at some early period in the life of the individual, probably during adolescence, some developmental disturbance occasioned a premature occlusion of the basisphenoidal, sagittal, and temporo-parietal sutures. The growth of the brain in the vertical and lateral directions was thereby stopped, and compensation took place in an abnormal backward growth. Either because of the bending of the cranio-facial base, from premature closure of the spheno-occipital suture, or, because of the backward displacement of the glenoid fossa caused by the excessive backward growth of the temporals, the normal articulation of the mandibular condyles with the glenoid fossæ became incompatible with proper dental occlusion. In consequence, during movements of mastication, the condyles slipped over the articular eminences into the temporal fossa, and never regained their proper position. This resulted in the atrophy of the condyles and the replacement of the eminentiæ articulares by new, more anteriorly placed, glenoid fossæ. It is difficult to see how the individual managed to open his mouth to any considerable extent without satisfactory articular fulcra. When the teeth are placed in proper occlusion the condylar stumps project unsupported into the temporal fossæ, the coronoid processes abutting against the posterior faces of the malar bones, which show depressions at the points of contact.

The atrophy of the mandibular condyles was necessary in order to allow free movement of the mandible in its new position during mastication. As would be expected from the peculiar forward position of the coronoid process in the temporal fossa, the area of attachment of the temporal muscles to the malar, frontal, and alisphenoid bones is unusually well marked.

Hooton is inclined to regard the unusual mandibular alveolar prognathism as an adaptation to unusual conditions of occlusion.

The extreme concavity of the lower border of the horizontal ramus below the coronoid root and the apparent fragility of the mandible at this point may be due to the fact that by the atrophy of the condyle the fulcrum of the mandible in opening has been shifted forward toward the coronoid process, thereby moving forward the point of strain in the horizontal ramus. The result was an increase in breadth and strength of the anterior portion of the ascending ramus functionally connected with the temporal insertion, and an atrophy of the posterior portion of the ascending ramus, with the exception of the insertion of the external pterygoid muscles at the angle of the ramus in the temporal fossa: while the upward slope of the palate also would tend to dispose the mandible in such a position that the horizontal ramus slopes sharply upward and backward, and a perpendicular dropped from the summit of the coronoid process would fall but a little behind the most anterior point of the mental eminence. Thus the direction of strain is almost vertical, and tends to coincide much more closely with the long axis of the mandible than it does in a normal jaw.

Possibly the unusual degree to which the palate is bent backward and upward may be due to the disarticulation of the jaw and the forward displacement of the temporal pull rather than to the premature ossification of the basisphenoidal suture. This would tend to throw the strain of the bite unduly upon the posterior half of the palate, and might conceivably prevent a proper vertical growth of the posterior portions of the superior maxillaries.

[*Interstate Medical Journal*, Chicago,
February 1919.]

Local Anesthesia in Children. BY ROBERT EMMET FARR.

For some years Farr has been testing the application of novocain in surgical work on children. The operations performed have included those upon the head, neck, limbs, external genitals, spine, and abdomen. In all 77 cases have been attempted with local anesthesia, and in only 7 of these has it been necessary to add inhalation anesthesia. Of these 77 cases, there was but 1 cleft-palate operation, on a child of fifteen years; and 4 cases of dissection of the neck for removal of

enlarged glands, ranging in age from four to fifteen years. From this experience Farr draws the following conclusions:

(1) The psychic element is not as important in children as in adults when operating under local anesthesia.

(2) Less restraint is necessary during the administration of the local than during administration of general anesthesia.

(3) Much more tact and a more refined technique are required in operating upon children under local than under general anesthesia.

(4) The margin of safety possessed by novocain over general anesthesia is as great in children as in adults.

(5) A large percentage of bad risks should have the benefit of this margin of safety.

(6) More extensive application of novocain in the surgery of children is indicated, and if a more common use of this drug obtained in this class of cases, the science of medicine as well as the art of surgery will be benefited.

[*Bulletin de la Académie de Médecine*, Paris, 1919, vol. 81, p. 52.]

Mandibular Fracture, Curing Spontaneously, from the Polished Stone Epoch.
BY MARCEL BAUDOUT.

A human mandible from Vaudancourt (Oise) was recently discovered in a military trench. The bone had been fractured in adult life, and had healed spontaneously, although in bad position. It is the first case known of prehistoric cure. It is very remarkable on account of the intensity of the displacement, the volume of new bone formed, and especially the hyperostosis of the genial apophyses, which during cicatrization were markedly elongated and thickened. These defects are attributable to difficulty of deglutition and attempts at speech.

The specimen presents another interest, exhibiting a prehistoric dento-alveolar mutilation (removal of incisors during youth) quite comparable to the ethnic mutilations still practiced in South America and Oceanica.

[*Journal of the American Medical Association*, July 26, 1919.]

Ankylosis of Jaw. BY GORDON B. NEW.

This is a report of a case, in which the ankylosis was ascribed to fixation of the temporal muscle sequent to a gasserectomy, per-

formed in two stages, using the Cushing incision, 3½ years before coming to New. Before the gasserectomy the patient had suffered for several years with trifacial neuralgia. Recovery was uneventful, except that he (age thirty-three at this first operation) was unable to open his mouth. Relief from pain had been complete and permanent.

New found that the ankylosis was complete, and the patient had received no treatment for it. Face symmetrical, no atrophy. It was inferred that the fixation of the temporal muscle was due either to cutting across it at the time of the operation or to secondary inflammatory reaction.

The technique of New's operation is detailed. The temporal muscle and coronoid process were removed. The temporo-mandibular articulation was found to be normal. In a week's time the patient could separate his teeth to the extent of one inch.

[*Journal of Infectious Diseases*, Chicago, August 1919.]

The Microscopic Appearances of Ulceromembranous Tonsillitis (Vincent's Angina). BY RUTH TUNNICLIFF.

The etiologic relation of fusiform bacilli and the associated spirochetæ to the diseases in which they are found is difficult of demonstration. The strongest evidence for an etiologic relationship is furnished by the examination of sections of involved tissues. The basis of this report was an ulceromembranous tonsil, removed during life. Clinically the case was typical of Vincent's angina. Sections were stained by Levaditi's method, methylene blue and Gram-Weigert. Fusiform bacilli and spirochetæ were present in enormous numbers in the zone separating the external necrotic epithelium and the living tissues. A considerable number are invading the normal tissue, the spirillar forms being the more abundant and in advance of the bacilli. These organisms are apparently not associated with cocci or other bacteria at the line of advancing necrosis.

[*Journal Dentaire Belge*, May 1919.]

Radicular Odontome from the Upper Quaternary. BY EMILE HUET.

The tooth in question, found in the Maurrenne cave (neolithic, d'Hastière), is a large left mandibular third molar, with two roots

apically sharply turned distally. The mesial root is slightly the larger, and on its lingual surface, almost at the point of junction with the distal root, it exhibits the odontome. This tumor is covered with a brilliant adamantine tissue, sharply delimited, and about 1.5 mm. in diameter. The mesial root is affected with a slight cementosis, attributable to some difficulty during eruption. At the cervical line there is a collection of calculus.

[*American Journal of Insanity*, Baltimore, April 1919.]

Correlation Between Mental Defect and Anomalies of the Hard Palate. BY IRENE CASE.

The present report is based on measurements of casts obtained from children appearing before the Psychopathic Laboratory of the University of Chicago. The number of casts is as follows:

	Male	Female	Total
Normal mentality	5	3	8
Abnormal	28	10	38
Total	33	13	46

The specific measurements made were—

(A) Minimum distance between first molars, measured horizontally from bases of molars.

(B) Maximum height of palate, measured from plane of gum line.

(C) Distance from the line connecting the two first molars to the alveolar point.

(D) Distance between canines, measured horizontally from their bases.

In addition to these four measurements, any asymmetry of the palate was noted, and also the length, breadth, and circumference of the head; and mental age, as determined by the Yerkes-Bridges point scale test.

From these data it might be concluded that the probabilities are high that there is a real difference between psychologically normal and abnormal individuals only in the case of the height of the palate, and that there is no significant difference in the case of the three other measurements.

The question arises as to whether this increased height of the palate in abnormal individuals is a diagnostic symptom of mental defect, *i.e.* Is there a correlation between the height of the palate and mental ability, or

is the increased height of the palate in abnormal individuals due to other causes? Case, on the basis of her measurements, is inclined to believe that the greater average height of the abnormal palate may be due to variations in the size of the head.

In general, two types of palate were noted—(1) high and narrow, associated with narrow head (dolichocephalic), and (2) the low and broad, associated with broad head (brachycephalic). Because the palate is imperfect, it does not necessarily follow that the mentality is imperfect; *i.e.* there is no necessary connection between the degree of mental capacity and a high palate. The palate tends to be high in either normal or abnormal individuals when the head is narrower, shorter, or of less circumference than the norm for the corresponding age.

The casts of normal individuals tend to show asymmetry as generally as do the abnormal. In many cases the asymmetry is as great in the normal as in the abnormal palate. Asymmetry is not a distinguishing characteristic of the palate in abnormal individuals.

The volume of the abnormal casts, as measured in mercury, differs on the average practically not at all from the normal. The volume of the female cast is smaller in both averages for the normal and abnormal individuals.

[*Bulletin de la Académie de Médecine*, Paris, 1919, vol. 81, p. 646.]

Technique of Gasserectomy. BY JULIEN BOUGUET.

This method according to the author is simpler than Frazier's (see DENTAL COSMOS, 1918, p. 829). It is unnecessary to ligate the external carotid or to resect the zygoma. A curved incision is made, concavity downward, in the temporal region, commencing at the level of the malar and ending in front of the tragus. The bone is then removed. There are then revealed the superior and inferior maxillary nerves, which when followed lead directly to the gasserian ganglion. The middle meningeal artery is ligated and cut, and the fibrous connections with the dura are severed, otherwise some of the ganglion may be left. Keratitis neuroparalytica follows in some cases, but is amenable to appropriate treatment.

[*Interstate Medical Journal*, Chicago,
March 1919.]

Vertigo and Focal Infection. BY ALBERT
E. TAUSSIG.

Case 1, male of sixty-eight years. Bad family history; alcoholic, an uncertain history of syphilis; an increasing deafness in left ear of some years' duration. For over one year he had had violent paroxysms of vertigo with vomiting. Physical examination negative, except tortuous and calcareous arteries and enlarged liver. Almost all the teeth lost, except "a few old snags"; extreme *fætor ex ore*. It was first thought that arterio-sclerosis might be the cause of the vertigo, but nitroglycerin gave no relief. Upon otoneurologic examination the diagnosis was made of toxic labyrinthitis due to focal infection. Roentgenograms revealed apical infections. Teeth removed. Two attacks of vertigo occurred during the following week, but none thereafter. Under observation at least two years.

Case 2, male of sixty-two years. Enlarged liver, chronic interstitial nephritis, duodenal ulcer, Wassermann negative. Had been dizzy

occasionally for some three or four years before violent paroxysms of vertigo began. Neurotologic tests suggested toxic origin from an infectious focus. Tonsils negative. A left mandibular premolar loose; extracted. Since then no vertigo. Under observation almost one year.

[*Presse Médicale*, Paris, May 22, 1919.]

Lichen Planus of the Mucosa and Leukoplakia. BY A. J. L. BROCC.

Brocq protests against the universality of the three following generalizations, which are widely accepted:

(1) Every permanent white patch of the mucosæ is leukoplakia.

(2) A syphilitic terrain is indispensable for the development of leukoplakia.

(3) Leukoplakia is the beginning of epithelioma of the mucosæ.

Five cases are referred to as illustrations, in three of which it was a question of lichen planus. Differential diagnosis is not always easy, and is complicated by the fact that lichen planus and true leukoplakia may co-exist.

PERISCOPE

Broken Nerve Broaches.—Nerve broaches broken off in a root-canal can be easily removed after a dressing of 25 per cent. pyrozone applied on cotton has been left in the canal for a few days.—*Oral Health*.

Soldering.—In soldering gold, when it is desired to restrict the flow of solder to certain areas, draw a line around the desired area with a sharp lead pencil; the solder will not flow past the line.—*Dental Surgeon*.

Softening the Automatic Mallet Blow.—Most of the automatic mallets strike a live and somewhat of a recoiling blow, with the steel striking steel. If the instrument is opened and a washer of rawhide made and fitted to the anvil upon which the weight strikes, and then assembled again, we will have a mallet that delivers a cushioned blow without the objectionable noise.—F. W. F., *Pacific Dental Gazette*.

Importance of Properly Reproducing the Occlusal Surfaces.—Let me emphasize the necessity of reproducing the anatomy of the occlusal surface of the tooth. Nature always has a plan, and a reason for the plan, and when she shaped the occlusal surface of the tooth in a special way she did it for a special reason. We can do no better than to follow her as closely as we can.—J. V. CONZETT, *Journ. N. D. A.*

Swaging with Moldine.—Facings are easily backed with pure gold by the following swaging method: Grind the facing to the desired form, select the backing, and cut it to allow a little for trimming. Force it over the pins in the desired relationship. Then wrap facing and backing in a little tissue paper, embed all in moldine, and place this in the S. S. W. swager or a similar device. A light blow from a hammer will give perfect adaptation without any danger of fracturing the facing.—F. W. F., *Pacific Dental Gazette*.

Impression Cup Technique.—After the root has been prepared for the porcelain jacket crown the root impression should be made with modeling compound held in an individual impression cup. This cup may be made at the chair in a minute or two by the following technique: Select a strip of copper of 32 or 34 gage, several millimeters wider than the length of the stump, and long enough to allow for a reasonable lap. This lap is then quickly soldered with soft solder, using the cement liquid as a flux.—C. G. HANSLEY, *Pacific Dental Gazette*.

Finishing Amalgam Fillings.—Some operators recommend the use of tinfoil in finishing these fillings. They say it will absorb the excess of mercury, and thus make a denser filling. This, however, is a questionable procedure, for the tinfoil also changes the balance of the alloy by adding a certain amount of tin to the surface of the restoration. This is very objectionable, because the surface of the filling will shrink somewhat, and thus damage the margins. My technique is that of using the exact proportions as recommended by the manufacturers.—*Pacific Dental Gazette*.

Backing for Steele Facings.—Cut a piece of gold (22-28) the size of the facing, and with a wheel bur cut a slit in the center. To make the lug, use a piece of 22-30 about $\frac{1}{4} \times \frac{1}{2}$ in. Cut the barbed end off a broach, and place the tapered end of broach in the center of this piece of gold; with flat-nose pliers form the lug around the broach, tapering one end so it will slide easily into the facing. Then place the lug in the facing, and with a separating stone cut the extending gold in a triangular shape so it will pass into the slot in the backing. Bend over the ends and solder them to the backing.—P. A. HAAS, *Dental Summary*.

Securing Canal Broaches.—To prevent dropping short canal broaches into the throat, always apply the rubber dam before using, covering enough teeth to furnish ample space for manipulating the broach. If for any reason the dam cannot be adjusted, tie a waxed ligature to the hub, and leave enough ligature to extend well out of the mouth. This will allow of all proper manipulation, and render it possible to rescue the broach in case it slips out of the finger-grasp, and prevent its dropping into the fauces. A piece of orthodontia wire can also be attached to the hub of the broach, but it does not give as much freedom in manipulation.—*Dental Register*.

Tonsil Infections.—(1) The tonsils are the principal foci of infection in throat carriers of streptococcus hemolyticus: (a) Cultures taken from different parts of the nose, mouth, and throat show more streptococci in the tonsils than elsewhere; (b) cultures from excised tonsils show streptococci in 75 per cent. of cases; (c) crypt cultures show a higher percentage of positive results than surface cultures; (d) excision of the tonsils renders the throat negative in nearly all cases.

(2) The streptococci isolated from tonsils and throats show no cultural difference on sugar media from those obtained from empyema fluids.

(3) Excision is the only radical method of curing carriers of infection: (a) Dobell's solution, dichloramin-T, and hot alcohol had little better effect than no treatment; (b) silver nitrate, 25 per cent., gave better results in negative throat cultures, but the crypts frequently remained positive.

(4) The presence of hemolytic streptococci in pathologic tonsils is an additional reason for their removal.—H. J. NICHOLS and J. H. BRYAN, *Journ. A. M. A.*

Preparation of the Mouth in Cases of General Anesthesia.—It is quite plain that if the subject's mouth be not in a satisfactory state of cleanliness, it is necessary to set about making it so without a moment's delay, and in such case only the specialist is in a position to fulfil the requirements, viz:

(a) Removal of tartar.

(b) Extraction of all infected or loose roots, verification of any pivoted teeth, crowns, and fixed dental apparatus.

(c) Grind down and obturate any crown that might scratch the tongue or get broken when the gag is applied.

(d) Clean all alveoli, and get rid of any pus therein contained.

(e) Remove all movable dental apparatus before resorting to anesthesia.

In short, get rid of all septic and movable things in the mouth that might fall into the pharynx and be swallowed or breathed into the bronchi while under anesthesia.

It is obvious that pus of buccal origin swallowed by an operated subject who is the victim of well-marked post-operative shock may give rise to septic complications, possibly of a grave kind. Many pulmonary accidents following anesthesia may conceivably be due simply to the entrance of pus, tartar, and other septic elements of buccal origin into the air-passages.—PIERRE ROBIN, *Oral Health*.

Vomiting and Nausea under Anesthesia.

Vomiting, although not occurring often, may be one of the most annoying conditions which we encounter. If vomiting actually occurs during any stage of anesthesia, and the mouth and throat are filled with solid food particles, it is wise to discontinue the anesthetic for a few moments, allowing time to remove all food debris from the air-passages. Vomiting during anesthesia is possible only when anesthesia is light. When the tendency toward vomiting is noticed, anesthesia should be deepened, because light anesthesia stimulates the vomiting center. Nausea after anesthesia is always the result either of too recently partaking of food or, as will more frequently be the case, when the patient is afflicted with some form of stomach trouble. In practically all cases of post-operative nausea, when nitrous oxid and oxygen has been used, a history of easily induced nausea will be discovered.—J. P. HENAHAN, *Journ. N. D. A.*

The X-ray in Dentistry.—The X-ray has become the eye of the modern dentist. He is now able to see many things that were formerly as a closed book. The X-ray is, in many cases, just as essential to the dental operator as is the root-canal instrument.

Dental progress has been so rapid that there is a grave danger of the too conservative members of the profession living in the past. We are apt to unconsciously slip into a rut, and then wear it so deep that we cannot see over the top. An X-ray machine will do more to pull a dentist out of the rut and put him on high ground than any other single agency we can think of.

There are doubters abroad, and skeptics still abound, but after every phase of the X-ray question has been discussed and all the limitations and failures noted, the fact still remains that modern dental service cannot be rendered without the aid of the X-ray, and the dentist who persistently ignores this fact is trying to lift himself by his boot-tops. It is impossible to disassociate the X-ray from successful practice.—EDITORIAL, *Oral Health*.

Anesthetics in Dentistry.—As a result of research and observation carried on by Dr. Crile and his associates, he has made the following statement:

"Each anesthetic covers part of the field, but there is no single agent that alone can produce anoci-association, which is the goal of operative surgery. We therefore do not advocate ether alone, nor chloroform alone, nor nitrous oxid alone; we do not advocate local anesthesia alone, nor morphin and

scopolamin alone, nor spinal anesthesia alone, but through selection and combination of anesthetics we aim to attain an anesthesia that will exclude all stimuli from the brain, and thereby attain anoci-association."

The object of this paper is in no measure intended to detract from one, nor yet to make unreasonable claims for another form of anesthesia. It is simply intended at this time of enthusiasm in connection with something new, to again draw attention to that older form of anesthesia which has been the standby of our predecessors and which today is more frequently used than ever before, nitrous oxid and oxygen.

This agent has been demonstrated as being the safest of all anesthetics; it interferes less with and impairs less the natural immunity of the patient than any other anesthetic.—J. P. HENAHAN, *Journ. N. D. A.*

Essentials of a Practical Articulator.—

In the first place a practical denture should be made upon an articulator that is capable of adjustment to the exact triangle of the jaw for which the plate is to be made. This undoubtedly is the kernel of the whole process of plate-making. An articulator of this kind should have just as few parts as possible. It should be light, though rigid; it should be simple to manipulate.

An articulator of this description needs not to bother with the so-called center of oscillation (or rotation, as some call it, though wrongly), and this is one trying thing that can be eliminated from the more complicated methods. While I am speaking of eliminating some of the complicated methods in plate-making, let me say that the "incisal plane" has been made too much of, for this reason: The beautiful anatomical teeth that are obtained at the present day have the canine and bicuspid angles so perfectly arranged that the teeth slide almost automatically to their proper places. A little grinding makes them practically perfect.

Another thing that has been made much of in anatomical occlusion is the "lateral movement." The lateral movement must be there all right, but complicating plate-making in trying to get this down to "regulation size" upon an articulator is much of it mere moonshine. One need not worry about the lateral movement if his work has been done on a simple articulator the size of the triangle of the jaw of the patient for whom the plate was made. Right style of teeth and a little grinding will do the rest, and is about all the heart desires.—W. C. DALBEY, *Dental Summary*.

Asepsis in Filling Root-canals.—To my mind, a so-called complete root-canal filling is the ideal result of an operation, the adjective "ideal" characterizing it as something that cannot be accomplished. The only means we have at the present time to judge a root-canal filling *in vivo* is by means of the X-ray, and everyone knows that such an examination will not permit the operator to state that the apical foramen and all the accessory foramina are hermetically sealed, nor that all the infection had been removed, nor that reinfection will not take place. The fact that a negative culture was obtained from a root-canal just previous to its being filled does not guarantee that reinfection cannot take place. I have yet to see the dentist who, during a root-canal operation, will not forget himself at some time, and touch some object which will cause the infection of the field of operation. And I really cannot blame him for it, because it certainly seems quite impossible to keep everything sterile during such a prolonged and intricate procedure. Even a root amputation is not advisable in case the patient is suffering from a systemic malady, as the remaining part of the root—no matter how treated—may act as a foreign body, and present a *locus minoris resistentiæ*.—THEODOR BLUM, *Dental Forum*.

The Dental Hygienist.—Our helper is the dental hygienist. She is the channel through which the knowledge we have acquired of prevention can be disseminated. Our efforts must be analogous to those of the medical profession in regard to tuberculosis. We have no specific, but we do know means by which the disease can be prevented and controlled. What hope could the medical men have to prevent or control tuberculosis without the aid of the medical nurse? What hope have we to educate the public in the preventive methods that we know of except through the dental hygienist? The prophylactic treatment itself is not her greatest service. She is not a mechanical operator. The greatest service she can perform is the slow and painstaking education and enlightenment of the public in mouth hygiene and allied branches of hygiene. Primarily she must be a hygienist and educator; secondarily, a prophylactic operator.

A country-wide education and training of these women should be begun at once. The dental profession must accept this obligation to the public, and every state in the Union must make provision for the places of train-

ing. Fortunately it does not require a graduate dentist to enlighten the public in the prevention of dental diseases, although it is essential that he be able to do it. What it *does* require is thousands of dental hygienists, women especially educated and trained, to care for the school children, and other thousands for service in private offices, orphanages, hospitals, and any other place where the dental profession attempts to fulfil its duty to humanity.—A. C. FONES, *Dental Items of Interest*.

Selectivity of Organisms.—About a year ago it was reported that rabbits had been injected with streptococcus viridans obtained from alveolar infections, and that these organisms had in all cases, and by virtue of their peculiar selective characteristics, attacked the serous and synovial membranes of these animals, all of them showing arthritis and endocarditis. The attempt was made thereby to prove that the streptococci contained in granulomas at the root-ends of teeth had a very definite bearing on sequential results, namely, endocarditis and arthritis. These experiments have been widely discussed by men who lack scientific training, and who accepted these statements as facts. The experiments were made to prove the selectivity of organisms. In other words, when organisms obtained from such locations as granulomas and abscesses at the apices of teeth were introduced into the ear vein of rabbits, this invariably being followed by attacks by these organisms on the synovial membranes, it shows their tissue selectivity for this particular tissue. Such findings, however, do not prove any such fact. It has since been found that any organism introduced in such manner attacks the synovial membranes, producing arthritis and endocarditis, and many other symptoms of sepsis.

Evidently it is not the selective action of organisms which produces these results, but it is the fact that these particular tissues are very amenable to such attacks by any organisms: not a chemotactic process between the organism and the tissue at all. Many investigators have proven repeatedly the fallacy of the selective factor, and have demonstrated the same end results, namely, arthritis and endocarditis in rabbits, by injections of bland chemicals or, as has been shown by Professor Rufus of New York, even by the introduction of plain egg albumin.—H. H. SCHUHMAN, *Dental Summary*.

OBITUARY

Dr. John F. Dowsley.

[SEE FRONTISPIECE.]

DIED, July 17, 1919, at his home in Newton Center, Mass., in his sixty-sixth year, from heart failure. JOHN FRANCIS DOWSLEY, D.D.S.

Dr. Dowsley was born on February 14, 1854, at St. Johns, Newfoundland, the son of Warren Felix and Margaret (Beates) Dowsley. His father was a prominent physician of St. Johns. Dr. Dowsley obtained his early education in the public schools of St. Johns, St. Bonaventure, P. Q., and later in the high schools of Boston. Dr. Dowsley took up telegraphy in his early manhood, and while thus engaged he became interested in dentistry, and entered the Boston Dental College in 1882. In 1883 he entered the Baltimore College of Dental Surgery, and was graduated from that institution with the D.D.S. degree in 1884.

In 1884 he established himself in practice in Boston, where he continued to practice his profession until the time of his death.

In the year 1887, when the new dental law for the State of Massachusetts was enacted, he was appointed by Governor Russell to the Board of Registration in Dentistry, and served on the board for twenty-seven years, being its president for twenty years.

During his long years of faithful service on the Board of Registration in Dentistry Dr. Dowsley became known as the father of dental legislation in New England. He stood as the guardian of the public against charlatanry in dentistry, was always active and interested in every movement to raise dental educational standards, and constantly wielded a strong influence in protecting the public from the incompetent and poorly trained dentist.

At the founding of the Forsyth Dental Infirmary for Children in 1910, Dr. Dowsley was chosen as one of its incorporators, later becoming a trustee of the Infirmary, in which capacity he served the institution until the

time of his death. He was one of the guiding spirits of the Infirmary, and gave much of his time to this charitable work. It was upon his suggestion that the institution placed its services and facilities at the disposal of the Government at the outbreak of the war for the dental preparation of recruits for war service.

Dr. Dowsley was a member and ex-president of the National Association of Dental Examiners, the Massachusetts Dental Society, the Northeastern Dental Association, and the New England Association of Dental Examiners, of which latter association he was one of the organizers. He was also a member of the National Dental Association, the Metropolitan District Dental Society, the American Academy of Dental Science, and the Delta Sigma Delta Fraternity. He was a delegate to the World's Columbian Dental Congress, at Chicago in 1893, the Fourth International Dental Congress, St. Louis, in 1904, the Fifth International Dental Congress, Berlin, 1909, and the Sixth International Dental Congress, London, in 1914.

Dr. Dowsley was twice married: On February 4, 1885, to Miss Mary A. Cloney of Boston, who died in 1899. On February 25, 1911, he was again married to Miss Mary Isabelle Ford of Boston, who died December 7, 1912. He is survived by three children, Mrs. Sydney Killion, Miss Margaret Dowsley, and John F. Dowsley, Jr.

His remains were interred in the cemetery at Newton Center, Mass., July 19, 1919.

Dr. Arthur V. Prentis.

DIED, at his home, New London, Conn., Wednesday, June 25, 1919, after a protracted illness of nearly two years, ARTHUR V. PRENTIS, D.D.S.

Dr. Prentis was born in New London, Conn., August 7, 1879, the son of Dr. Edward and the late Harriet (Norkett) Prentis. He obtained his early education in the public

schools of New London, being graduated from Bulkley College in 1897. Very soon thereafter he entered the New York College of Dentistry, from which institution he was graduated in 1902. Immediately after his graduation he began the practice of his profession in Salisbury, Conn., removing two



ARTHUR V. PRENTIS.

years later to New London, where he continued to practice until the time of his illness.

Dr. Prentis was of a social disposition, highly successful in the practice of dentistry, and made many steadfast friends in the community, whose kindly remembrances of him during his long months of illness were a source of great comfort and cheer to him. He had a delightful personality, extremely genial and pleasant in his social relations, and ever loyal to his host of friends both in the profession and in the community in which he lived. The dental profession, and particu-

larly the local profession in New London, has suffered a great loss in the death of one who promised much for the future, and whose untimely decease is mourned by all who enjoyed the privilege of his acquaintance and friendship.

Dr. Prentis was a member of the Connecticut State Dental Association, serving as its president in 1916; a member of the Horace Wells Club, the National Dental Association, and the Psi Omega Dental Fraternity. He was also a member of the New London Lodge of Elks, and a member of the Thames Club, which latter he also served one term in the capacity of president.

Dr. Prentis was married in 1907 to Miss Mabel Freeman of New London. He is survived by his widow and three small children, his father, Dr. Edward Prentis, a brother, and two sisters.

Mr. George L. Primrose.

WE regret to announce the death of Mr. GEORGE L. PRIMROSE, of Rochester, N. Y., which occurred on April 29, 1919.

Mr. Primrose was born in Philadelphia, Pa., on January 6, 1849. He entered the employ of the S. S. White Dental Mfg. Co. in 1874 as a traveling salesman through the central portion of New York State. In 1897 the company established a branch house at Rochester, N. Y., and Mr. Primrose was made manager, and served the company in that capacity until 1914, when the Primrose-Johnson Dental Co. was organized, and continued the business of the S. S. White Rochester branch.

Mr. Primrose was well known and highly esteemed by a large number of dentists of central New York, all of whom will regretfully miss his presence and friendly greetings at the various New York dental society meetings.

DENTAL LEGISLATION

ETC.

CHILD ORAL HYGIENE IN NEW YORK.

(I.) New York City: Ordinance Establishing a "Division of Oral Hygiene" in the Bureau of Child Hygiene of the Department of Health.

AT a meeting of the Board of Aldermen of the City of New York, on July 1, 1919, the Dental Ordinance introduced by Alderman Dr. Maurice S. Calman was favorably acted upon and was referred to Dr. Royal S. Copeland, the Health Commissioner, for action.

In a letter dated the 17th of July, Dr. Copeland writes to Dr. Calman as follows:

My dear Alderman,—In the budget for 1920 I am asking for nine additional dentists and eighteen dental hygienists, and I shall greatly appreciate it if you will use your influence to assist in getting the matter through.

I am glad to know that your ordinance passed the Board of Aldermen, and you may depend on it that I shall be governed accordingly. I am heartily in favor of this whole program, and hope to see the dental problem more energetically met by the City of New York. I look forward to the time when there will be a dental office in every public school in this city which, at regular intervals, will be used by officials of the department of Health to correct the dental defects as found among the children attending school.

The ordinance as introduced by Dr. Calman reads in part as follows:

AN ORDINANCE

ESTABLISHING A DIVISION OF ORAL HYGIENE
IN THE BUREAU OF CHILD HYGIENE OF THE
DEPARTMENT OF HEALTH.

*Be it ordained by the Board of Aldermen of
the City of New York as follows:*

SECTION 1. There shall be established a division of Oral Hygiene in the Bureau of Child Hygiene in the Department of Health.

SEC. 2. The purpose of such division shall be to establish and maintain such clinics and other agencies as may be necessary to secure for the children of the public schools adequate prevention and protection from dental deterioration and disease.

* * * * *

SEC. 4. The said division shall be organized immediately, and upon its organization shall take over and operate the dental clinics now existing under the jurisdiction of the said department of Health.

SEC. 5. The said division shall immediately upon its organization proceed to establish at least nine additional dental clinics in those public schools where the greatest need is found to exist, and shall from time to time continue the establishment of such further clinics as may be found necessary to carry out the provisions of this Act.

This ordinance shall go into effect immediately.

(II.) Rural School Clinics in New York State.

THE Rochester Dental Dispensary has recently extended its services to the children of the rural schools of Monroe county. Rural school children will be either taken to the dispensary for atten-

tion or attachés of the institution will be sent to different centers in the county, where dental clinics will be held.

During the last week of the school year Superintendent Burkhart sent one

dentist with six dental hygienists to East Rochester, where the mouths of 900 pupils were carefully examined, all teeth thoroughly cleaned, a chart made of mouth conditions in each instance, and definite instructions given to children as to the proper care of their teeth. One entire week was devoted to this service.

A school nurse is now notifying the parents of dental defects found, and endeavoring in a systematic manner to secure their correction. This effective and practical co-operation between the school authorities and the Rochester Dental Dispensary was accomplished by District Superintendent M. B. Furman of East Rochester aided by the local Red Cross Chapter. The entire cost was \$180, or 20 cents per pupil, which was

paid by the local Red Cross organization.

All of the school district superintendents of the county will unite in extending this mouth hygiene campaign to their schools, which will include special attention to tonsillar and adenoidal conditions.

A special equipment has recently been installed in the Rochester Dental Dispensary for dealing with nose and throat conditions. In New York state, school dental inspection is a part of school medical inspection, under the general direction of the State Education Department.

Dr. Burkhart is to be congratulated on the splendid services he is rendering to the school children of Monroe county.

DENTAL COLLEGE COMMENCEMENTS

University of Pittsburgh, School of Dentistry.

At the annual commencement exercises of the School of Dentistry, University of Pittsburgh, the degree of Doctor of Dental Surgery was conferred on the following graduates:

Myer R. Alderman	Phillip Freinberg	C. A. Lontzenhiser	Louis E. Robbins
George W. Allison	William McK. Furnier	Stephen V. Luddy	Harvey D. Roberts
Charles V. Allshouse	Roger D. Galey	Lloyal B. Lutes	Benjamin J. Schechter
George R. Allshouse	Hobart W. Gatewood	Harrison K. McGowan	Martin O. Siemon
Jesse A. Alter	Norbert J. Gestner	Charles A. McGuire	Edward R. Skinner
Joseph E. Baldridge	Max Goldstein	George W. McLaren	Charles G. Speck
Leslie C. Baldwin	Edward F. Hager	Paul W. McMahon	Edward A. Stahl
Richard L. Black	William E. Harrington	Frank B. McNulty	Leland S. Stanford
John O'R. Boyle	Ralph B. Hess	Robert LeM. Mapel	Joseph W. Stanger
Alonzo T. Briney	John E. Hugus	Matthew Marcus	W. Norman Stein
Clair M. Bunting	William J. Hutchison, Jr.	Wayne Martin	Braden H. Swaney
Donald S. Carnahan	William H. R. Irvin	John A. Meehan	Maurice A. Taylor
George V. Carter	Herbert L. Ittel	Ralph E. Miller	Godfrey Terry
Hugh A. Cochran	J. R. Jackson	Clyde L. Mitchell	Plennie G. Toothman
Earl B. Conaway	Benjamin H. Jones	Paul R. Montgomery	Lawrence E. Van Kirk
John A. Daley	George T. Jones	Martha E. Morgan	Donald C. Walker
James A. DeWeese	James D. Kellogg	Vesta T. Moyer	Allen D. Weinsweig
Roy A. Easterday	George Kesel	Carl H. Muth	Robert L. Weller
Charles R. Elliott	Edwin H. Kistler	John B. Nelson	Vane C. Wells
Russell J. Engleka	Lloyd V. Knapp	John G. Nelson	Richard T. Wick's
John H. Euwer	Louis R. Landay	Harry T. Patton	Bayard A. Wright, Jr.
Cassie Ferrando	Maurice H. Lapidus	Robert N. Penman	George F. Wright
Amsbry H. Fetterman	David C. Leonard	David B. Pitler	John G. Yoder
Venceslaus Firewicz	Glenn H. Long	Leonard N. Ray	

University of Iowa, College of Dentistry.

At the annual commencement exercises of the College of Dentistry, State University of Iowa, held in Iowa City, Iowa, the degree of Doctor of Dental Surgery was conferred on the following graduates:

E. J. Amish	Iowa	James P. Leonard	Iowa
H. L. Anderson	Iowa	Carl E. Liabo	Wisconsin
V. R. Anderson	Colorado	Gordon R. Luce	Iowa
Everitt F. Arnold	Wisconsin	M. Irving Lutz	Iowa
Francis R. Bales	Iowa	Jay M. Lynch	Iowa
Ivan E. Beekwith	Iowa	Richard G. Lyon	Iowa
Paul H. Belding	Iowa	Raymond A. McFate	Iowa
Charles A. Boatman	Iowa	Wayne C. Martin	Iowa
Eugene W. Bond	Montana	Takaaki Matsuchima	Japan
Walter J. Brucher	Iowa	Horace E. Miller	Iowa
T. Wilson Bullock	Iowa	Ralph M. Miller	Iowa
William H. Coles	Iowa	Lloyd M. Morrow	Iowa
B. Ray Cooley	South Dakota	Hart F. Nelson	Iowa
Floyd C. Coppersmith	Iowa	Frank W. Nelson	Iowa
Ira A. Cornell	Wisconsin	Carl W. Nevius	Iowa
Kenneth P. Cotton	Iowa	Glenn O. Nichols	Iowa
Harry T. Couser	Iowa	J. Earl O'Donnell	Iowa
Harv M. Fhred	North Dakota	Ira E. Murphy	Iowa
Alfred Deighton	Iowa	Irving A. Osmundson	Iowa
Ernest H. Dowden	Iowa	Merle Ostroot	South Dakota
Lyle D. Fanton	Iowa	Harold H. Ozanne	Iowa
Martin B. Feese	Iowa	Thornton W. Parish	Iowa
Leslie M. Fitzgerald	Iowa	Willard H. Parry	Iowa
Percy G. Flack	Idaho	Clifford J. Peterson	Minnesota
Caryll S. Foster	Iowa	Harvey J. Piercy	Iowa
John E. Foster	Iowa	Albert J. Ploog	Iowa
Will H. Frishie	Iowa	Rudolph O. Rasmussen	Minnesota
Harley E. Gill	Iowa	Finis C. Reese	Nebraska
Rupert H. Gillespie	North Dakota	Ernest J. Ricks	Iowa
Palph Le M. Good	Iowa	Fred Rinkler	Iowa
Carol H. Goodwin	Iowa	Harv W. Rosche	Iowa
Clarence E. Green	Iowa	Perle W. Schneek	Iowa
Glenn J. Greenwood	Iowa	Adolph Scheller	North Dakota
Frederic E. Haberle	Wisconsin	Christopher C. Sheedy	Montana
Alfred J. Hansen	Iowa	Louis W. Shortell	Iowa
Jerome B. Hathorn	Iowa	Benjamin C. Singleton	Missouri
A. J. Heiny	Iowa	Irving M. Skuttle	Minnesota
C. R. Heiny	Iowa	Lester M. Smith	Iowa
John L. Hesselhuus	Illinois	Harv William Snyder	Iowa
Herman H. Holliday	Iowa	Harry Witt Snyder	Iowa
Millard G. Homan	Iowa	Clad C. Stewart	Iowa
Lyman O. Hopkins	Iowa	Ira J. Stewart	Kansas
Albert N. Humiston	Iowa	David S. Stevenson	Iowa
Hugh F. Ilgenfritz	Iowa	Hoyt W. Stonebrook	Iowa
Everitt D. Jack	Iowa	Lyle E. Stribley	Iowa
Fred H. Jess	Iowa	Herman C. Struck	Iowa
Helmer G. Johnson	Iowa	John F. Swanson	Iowa
Leland R. Johnson	Iowa	Willard F. Todd	Iowa
Walter H. Johnson	Iowa	H. O. Voegel	Iowa
Hobart M. Kahlev	Iowa	Leonard E. Von Berg	Iowa
Herschel W. Keller	Iowa	Charles C. Wagner	Iowa
Robert Kern	Iowa	Claude C. Wells	Iowa
Carl J. Kessler	Iowa	Frank L. Wheeler	Iowa
Merle Kirkpatrick	Iowa	Jesse Wiese	Iowa
Delbert J. Kratz	Iowa	Henry M. Willits	Iowa
Oscar W. Kress	Iowa	Max U. Wilson	Iowa
Joe B. Lane	Iowa	C. F. Young	North Dakota
Raymond F. Langland	Iowa		

Tufts College Dental School.

At the annual commencement exercises of Tufts College Dental School, held in Boston, Mass., the degree of Doctor of Dental Medicine was conferred on the following graduates:

George I. Abbott	Vermont	Adolphus R. Gleitsman	Massachusetts
Max Abramovitz	Massachusetts	Martin G. Gough	Massachusetts
Warren L. Adams	Massachusetts	Fred B. Grady	Massachusetts
Charles R. Anderson	Massachusetts	John J. Grady	Massachusetts
Earle R. Andrews	Massachusetts	Walter J. Grady	Massachusetts
Arthur Archambeault	Massachusetts	Walter G. Graichen	Massachusetts
Jeremiah F. Barry	Massachusetts	Timothy W. Hannigan, Jr.	Massachusetts
John F. Barry	Connecticut	Benjamin Hare	Massachusetts
Carl J. Bates	Maine	William L. Healey	Massachusetts
Ruth F. Bernot	Massachusetts	Edward S. Hobbs, Jr.	Massachusetts
Arthur Blasi	New Jersey	Kenneth B. Hodges	Massachusetts
Paul Boire, Jr.	New Hampshire	Howard P. Horrigan	Massachusetts
Arno M. Bommer	Massachusetts	Wilbur R. Hughes	Massachusetts
Dorothy G. Bonney	Massachusetts	James S. Hunter	Massachusetts
Frank Boyaner	St. John, N. B.	Gordon F. Jackson	Massachusetts
John A. Brodbine	Massachusetts	Isidore Jacobs	New York
Fred L. Bulfinch	New Hampshire	Clifford M. Jennings	Connecticut
Shirley A. Bunnell	Maine	José Just	Massachusetts
John J. Byrnes, Jr.	Massachusetts	Sophia Kandib	Massachusetts
Francis M. Cahill	Massachusetts	Seraphim Karamallis	Massachusetts
Thomas G. Carmody	Rhode Island	Edward F. Keane	New Hampshire
Milio V. Caron	Maine	Robert E. Kelley	Rhode Island
Francis L. Cassidy	Massachusetts	Frank R. King	Canada
James F. Clancy	Massachusetts	George Kovar	Massachusetts
Ralph A. Clark	Massachusetts	Arthur G. Lanagan	Massachusetts
Abraham B. Cohen	Massachusetts	Robert R. Lasker	Massachusetts
James L. Congdon	Massachusetts	Joseph T. LeBourdais	Maine
Ralph Connell	Massachusetts	Harry L. LeClair	Rhode Island
Reginald Courant	Massachusetts	Louis C. Levenson	Massachusetts
Ernest A. Crossland	Massachusetts	Joshua S. Lipkind	Massachusetts
Lawrence H. Cummings	Massachusetts	Frederick A. Lloyd	Massachusetts
James L. Curran	Massachusetts	Joseph F. Lynch	Massachusetts
Abraham Daitch	Massachusetts	John H. McCarthy	Massachusetts
Russell H. Davis	Massachusetts	Everett H. McCormick	Massachusetts
Edward T. Deane	Massachusetts	John J. McCormick	Massachusetts
Louis P. Desjardins	Maine	John M. McCoy	Massachusetts
Robert I. Diamond	Massachusetts	Hugh J. McDonald	Massachusetts
Alfred J. Dion	Massachusetts	Paul C. McGowan	Massachusetts
Carl J. Donlon	Massachusetts	Frank M. McLean	Massachusetts
Thomas F. Dowd	Massachusetts	Forrest E. Macauley	Massachusetts
Frank H. Dunn	Massachusetts	Morris R. Machanic	Vermont
Eldon F. Egger	Massachusetts	Robert M. Mackintosh	Massachusetts
Arthur B. Eldridge	Massachusetts	James H. Martin	Massachusetts
Norman B. Emery	Maine	Augustine J. Moran	Massachusetts
Philip A. Enholm	Massachusetts	Frank W. Mottley	Massachusetts
Franklin M. Erlenbach, Jr.	Massachusetts	John F. Murray	Massachusetts
Raymond C. Everett	Massachusetts	Ivor P. Muzzey	Massachusetts
Joseph W. Fenton	Massachusetts	Najeeb Nackley	Massachusetts
Maurice J. Fenton	Massachusetts	George E. Nelson	Massachusetts
Harry I. Fine	Massachusetts	Frank O. Nikula	Massachusetts
Leopold Fishman	Massachusetts	George F. Norris	Massachusetts
Edmund J. Fitzgerald	Massachusetts	Doris Nutter	New Hampshire
William F. Foley	Massachusetts	Alfred J. Oliver	Massachusetts
Willard H. Foss	Massachusetts	Catherine V. O'Meara	Massachusetts
Jacob D. Freilander	Massachusetts	William L. O'Regan	Massachusetts
Gordon E. Garland	New Hampshire	Forrest D. Patriquin	Massachusetts
Benjamin H. Genn	Massachusetts	Arthur F. Pottle	Massachusetts
James R. Ginn	Massachusetts	Thomas J. Reid	Massachusetts
Harold Ginsberg	Massachusetts	William F. Reid	Massachusetts
Joseph Ginsberg	Massachusetts	Harold B. Reimes	Massachusetts

William A. Riley	Massachusetts	George L. Sundstrom	Massachusetts
Frank E. Ring	Massachusetts	Joseph R. Tasse	Massachusetts
Russell Roberts	Vermont	Irene C. Thresher	Massachusetts
Helen E. Ronan	Massachusetts	Anna Thurman	Massachusetts
John J. Rouslin	Rhode Island	Paul K. Titus	Massachusetts
Earl A. Saunders	Maine	Thomas Tomasi	Vermont
Samuel I. Schwartz	England	Stephen T. Vasilou	Massachusetts
Albert R. Sessler	Massachusetts	James E. Walsh, Jr.	Massachusetts
John I. Shea	Massachusetts	Roy H. Wark	Vermont
Matthew F. Shea	Massachusetts	Ralph D. Warren	Maine
Abraham S. Shubow	Massachusetts	Cornelius Weeks	New Hampshire
Raymond H. Skofield	Maine	Hadley F. Weeks	Maine
Howard C. Smith	Rhode Island	Ellerd H. Westhaver	Massachusetts
Maynard M. Smith	Maine	Herbert W. Wilder	Massachusetts
Harold E. Spear	Vermont	Herbert F. Wright	Massachusetts
Bradford J. Spencer	Connecticut	Ida E. Wright	Massachusetts
Milton C. Stephenson	Maine	Abram Zwoden	Rhode Island

University of Minnesota, College of Dentistry.

THE annual commencement exercises of the College of Dentistry of the University of Minnesota were held in Minneapolis, Minn., on June 19, 1919.

The degree of Doctor of Dental Surgery was conferred on the following graduates:

Albert F. Anderson	Harry I. Egdahl	J. Kenneth Lynde	Michael A. Sivinski
Harry W. Anderson	Virgil D. Elliott	Elmer C. McGill	Fred L. Skoedopole
Lloyd C. Anderson	James M. Foster	Samuel G. Mara	Roger B. Swenson
Arthur V. Aronson	Benjamin F. Fuller	William L. Medalie	Frederick C. Thiers
Claude W. Bierman	Jalmer S. Gletne	John G. Meisser	A. LeRoy Thomas
Henry R. Brandt	Otto F. Hallum	Elmer J. Mohn	Robert F. Thurston
Fiske I. Brooks	Ralph K. Hawley	Sylvester L. Murphy	Reuben A. Ulvestad
Earl R. Carpenter	Robert L. Hedburg	Ralph Payne	Ingvald S. Veblen
James H. Conway	August W. Johnson	J. Philip Pederson	George C. Weiser
Maynard E. Cook	Roman P. Kline	R. Ray Reed	Harry C. Wild
Leo A. Daum	Louis C. Krause	Herman D. Rostad	Ward T. Williams
Fred V. Davidson	Frans A. Larson	Willard L. Sahr	Benjamin P. Wrbitzky
Walter O. Dille	Mandel M. Levy	Ralph T. Searing	Arthur L. Wucke
Newton J. Dobson			

Medical College of Virginia, School of Dentistry.

At the annual commencement exercises of the School of Dentistry of the Medical College of Virginia, held in Richmond, Va., the degree of Doctor of Dental Surgery was conferred on the following graduates:

Hyman Bear	Virginia	Ernest F. Pope	North Carolina
Victor E. Bell	North Carolina	Clarence L. Porter	Virginia
Charles F. Bowles	Virginia	Ollie L. Presnell	North Carolina
Rudolph H. Bruni	North Carolina	Thomas A. Price, Jr.	Florida
Hugh C. Burrus	Virginia	Charles M. Quillen, Jr.	Virginia
John A. Coffield	Virginia	George D. Quillen	Virginia
Matthew P. Futrell	North Carolina	George H. Rice	Virginia
Charles B. Harloe	Virginia	Conway B. Smith	Virginia
Emory F. Hodges	Virginia	John J. Stigall, Jr.	Virginia
Willard D. Hoskins	Virginia	Henry M. Stryker	Virginia
Irby H. Hoyle	North Carolina	Thomas A. Underhill	North Carolina
Harvey H. Kellam	Virginia	Arch C. Wagner	Virginia
Russell M. King	Virginia	Isaac C. Wagner	Virginia
William H. Lewis, Jr.	North Carolina	Sterling K. Wallace	Virginia
Wymer W. Manning	Virginia	Leon J. Walton	Virginia
Edward S. Parson	Virginia	Atwood M. Wash	Virginia
William D. Pedigo	West Virginia	James B. West	Virginia

Washington University, School of Dentistry.

THE fifty-eighth annual commencement exercises of the School of Dentistry of Washington University were held in St. Louis, Mo., on Thursday, June 12, 1919.

An address was delivered by Rev. John William MacIvor, D.D.

The degree of Doctor of Dental Surgery was conferred by Chancellor Frederic Aldin Hall, LL.D., on the following graduates:

Edmond B. Arnold	Sylvester E. Fendler	Maurice A. London	Frank O. Raney
Alfred D. Barnett	Edward H. Fishgall	Harvey J. Long	Leo W. Reid
Carl J. Benning	William L. Glenn	Hilry P. Loudermilk	Arthur J. Reimers
John Blair	Herman R. Grandjean	Stanley J. McCarthy	John J. Rodden
Norman P. Brown	Forrest DeW. Harrison	James M. McLellan	Mack Taylor
Harry B. Burton	Vern L. Heath	Eugene H. Mahle	William C. Travis
George A. Clipner	Leslie C. Hilderbrand	Rolland T. Mathews	George H. Van Dusen
Archie D. Cooper	Bennoshin Ishibashi	Denver Nance	Russell C. Wheeler
Elmer N. Cox	Frank G. Kavanaugh	Loren O. Newport	Joseph C. Wieneke
Samuel N. Dalby	Sam Kippel	Alphonsus P. O'Hare	Launcelot A. Williams
Scott McK. Davidson	Leonard H. Kohm	Oliver F. Orton	Henry L. Wohlwend
Fred Elmore	William J. Kolb	Alvin J. Pesetke	James L. Wood
George L. Fearheiley	Fred M. Lavender	Christ W. Pieper	

Ohio College of Dental Surgery.

THE seventy-third annual commencement exercises of the Ohio College of Dental Surgery were held at the Odeon, Cincinnati, Ohio, Thursday, June 12, 1919.

Addresses were delivered by Col. Wm. G. Everson and Stanley L. Jordan, D.D.S.

The degree of Doctor of Dental Surgery was conferred by Chas I. Keely, D.D.S., president of the board of trustees, on the following graduates:

William J. Acomb	Ohio	Charles M. Malcolm	West Virginia
Arthur G. Anderson	Minnesota	George O. Mathewson	Vermont
Edward L. Ball	Ohio	Julius E. Maurer	Ohio
Gregory R. Beddow	West Virginia	Nathan H. Miller	Russia
Frank D. Binkley	Ohio	Jessie G. Monks	Connecticut
Carshall C. Carlisle	Ohio	Winfred Moore	West Virginia
Dale C. Carson	Ohio	Raymond S. Morris	Canal Zone
Gory N. Casto	West Virginia	John L. S. Murray	British West Indies
Leo C. Cavanaugh	Pennsylvania	Cornelius J. O'Donnell	Ohio
Holton W. Craig	Kentucky	Clemmer M. Peck	West Virginia
Charles A. Drake	West Virginia	Harry L. Pevsner	Russia
R. Elmer East	Ohio	Charles A. Rich	Kentucky
John L. Eickholt	Ohio	Stephen B. Rich	Kentucky
Bernard J. Farrell, Jr.	West Virginia	Clark L. Rusk	West Virginia
Casper H. Fletcher	Virginia	James W. Sawyer	Ohio
Edward J. Garrity	Ohio	Bishop A. Schmedl	Ohio
Walter A. Geiser	Ohio	Hiram J. Scott	West Virginia
Ralph H. Gillham	Kentucky	W. Stuart Sedgwick	Ohio
Lawrence M. Haberman	New York	John Kenna Skyles	West Virginia
James A. Hartman	Ohio	William E. Smith	Pennsylvania
Leo C. Heiler	Ohio	Abner J. Speaker	Pennsylvania
Shinichi Hirakawa	Japan	Donald H. Sullivan	Ohio
Charles A. Holland	West Virginia	Robert B. Sullivan	Ohio
Cecil M. Jividen	West Virginia	E. Craig Taylor	Ohio
Elmer W. Johnson	Indiana	Kenneth F. Turner	Ohio
William C. Jolly	Kentucky	Carl W. Vineyard	West Virginia
Stanley L. Jordan	Ohio	Howard O. Wall	Ohio
Felix F. Jung	Ohio	Reuben A. Walter	Ohio
Cornelius J. McCloy	Ohio	Lloyd O. Willhide	Ohio

College of Dental and Oral Surgery of New York.

THE annual commencement exercises of the College of Dental and Oral Surgery of New York were held in Carnegie Hall, New York City, on Friday, June 20, 1919.

An address to the graduates was delivered by Thomas Travis, B.D., Ph.D.

The degree of Doctor of Dental Surgery was conferred by John W. Boylston, vice-president of the board of trustees, on the following graduates:

Samuel Aaronson	Jacob B. Freiworth	Bernard B. Leight	Katherine D. Sanger
Abraham L. Abelson	David Friedman	Jacob Levenson	Martha E. Sapiststein
Samuel A. Ament	Sidney B. Furgatch	Lina Levine	Harry E. Scaletter
Charles Amsterdam	Benjamin Gabrielson	Samuel Levine	Nathan Schaffler
Aaron W. Appelbaum	Samuel Gerendasy	William Levine	William Scheer
Clara Atinsohn	Benjamin Glatzer	Pauline Lichtenstein	Abram J. Scheinberg
Joseph Axelrod	Daniel E. Gleason	Bernard Lichter	Samuel Schlossman
Leon Axelrod	Harry O. Goffin	Jacob C. Lifton	Lucian N. Schmitt
Abraham I. Bacon	William S. Goldberger	Samuel E. Linchitz	Alexander J. Schneider
David A. Bakst	Aaron T. Goldfarb	Morris Lubitz	Herbert Schreiber
Harry Beller	Israel J. Goldfarb	Benjamin Lurie	Hyman L. Schroeder
Pauline Bender	Henry Goldschlag	Leo Lyons	Matthew Schwartz
Mary N. Bercea	Abraham Goldstein	Ernest McDonald	Regina Schwartz
Isaac E. Berkelhammer	George A. Gomes	John F. Maher	Nathan Seligman
Henry Berkman	Emanuel L. Greenbaum	Murray S. Mahler	Theodore Schaftan
Alfred Beyer	Samuel Greenberg	Jacob H. Mand	Rose Shandel
Frank H. Biemer	Jacob Gross	Annis Mann	Archie Shapera
Abraham B. Blinn	Herman S. Handleman	Joseph T. Marder	Adele Sheinberg
Milton E. Blume	Nathan Harkavy	Herman S. Meltzer	May A. Sherman
Meyer M. Bogdonoff	Lamar A. Harris	Isidor Menkowitz	Louis Silverstein
Marie L. Borst	John D. Haugh	Harold L. Morse	Arthur L. Smith
Sylvan E. Bowles	Emil Hausman	Sylvia Moss	Fannie V. Socol
Alvin C. Breger	Maxwell A. Henkin	Timothy C. Murphy	Abraham Solovey
David Breslow	Saul Hirscher	Isidore Nager	Morris Sorock
David W. Brounstein	Harry E. Hoffman	William B. Nevin	Charles S. Steurer, Jr.
Sidney J. Byrnes	Fannie Hornstein	Henriette Ofner	Lena Stillpass
George R. Canfield	Ida Horowitz	Percy T. Phillips	Jacob Z. Strum
Fannie E. Capozzi	William F. Howley	Milton T. Platt	Harry O. Sumergrade
Abraham H. Cohen	Harry E. Jalofsky	Abraham Pollack	Abraham A. Sussler
Gershon G. Cohen	Abraham L. Janos	Bertha Pollak	Reginald C. Swann
Jesse M. Cohen	Max Joffe	Daniel Posen	Jacob Telsey
Samuel M. Cohen	Martha E. Jones	Louis Povill	Emanuel Tesser
William J. Collins	Max Kanowitz	Herman Preschel	William A. Towner
Harry N. Cotter	Paul Kaplan	George Prussin	Alexander Tretiak
Ernest A. Cyriax	Samuel Katchewitz	Walter A. Quinn	Samuel M. Tushnett
William Demarest	Jacob Katzenbogen	Roland K. Raphael	Sophia Udell
Ruth Dinaburg	Joseph Kavalier	George H. Rawson	Drahomir G. Ursini
Hyman Dintenfass	John S. Kelleher	Harry Reisman	Louis Wack
Irving Dubroff	Charles R. Kessler	Irving Reisner	Rosa S. Warlin
Abraham Duncan	Milton Klein	Joseph L. Riesner	Sidney Weinstein
Horace S. Dwyer	Philip Klein	Charles Robinson	Joseph C. Weiss
Anna Edelman	Otto R. Knauerhase	William A. Rochester	Joseph I. Weisman
Nathan Edelman	Maximus M. Koplin	Louis J. Rodier	Robert B. J. Whelan
W. J. R. von Elvershofen	Isidor Korn	Louis S. Rosenberg	David Wiener
Walter S. Englander	Howard J. Kramer	Jacob Rosenblum	Walter A. Wilson
George Enteen	Reuben Krellenstein	Abraham H. Rosenzweig	Minna Wolkind
Samuel Eolis	Allen I. Kristal	Arthur Rosenzweig	Benjamin Wolpert
Michael Epstein	Louis Landberg	Joseph Rudolph	Delbert LeR. Woolley
Abraham Esser	Ned Landsman	Bernard Sager	Madeline C. Wyatt
Richard Falk	Laurence Lazarus	Jack I. Saks	Augusta Yachelson
Nathan J. Fischbein	Carl Leff	Morris Samet	Morris B. Ziff

ARMY AND NAVY DENTAL NEWS

Assignments.

Army Dental Corps.

Week ending July 19th.

Maj. Richard K. Thompson to Walter Reed General Hospital, D. C., for duty.

Capt. Ernest P. Dameron to Fort McHenry, Md., general hospital 2, for duty.

Capt. John R. Maxon to Mount Clemens, Mich., Selfridge Field, for duty.

Week ending July 26th.

Col. Rex H. Rhoades to Fort Slocum, N. Y., for duty.

Lieut.-col. Arthur J. Skillman, report by wire to commanding general, Southern department, for duty.

Maj. Gerald S. Byrne report in Western department for duty.

Maj. Leigh C. Fairbank to Denver, Colo., general hospital 21, for duty.

Capt. Alonzo Gooch McCue, Jr., to Camp Lee, Va., for duty.

Capt. George Julian Sibley to Washington for duty in office of attending surgeon.

Capt. George J. Krakou to Camp Deming, Ga., for duty.

Capt. William R. Akeroyd report by wire to Southern department for assignment.

Capt. James Gardner Steiner to Camp Lee, Va., for duty.

Capt. Oliver James Christiansen to Camp Funston, Kans., for duty.

Capt. Charles L. Andrews, to Fort Douglas, Utah, for duty.

Capt. Leland Stewart Wilson to San Diego, Calif., Rockwell Field, for duty.

Capt. Frederick C. Daniels to Jefferson Barracks, Mo., for duty.

Week ending August 2d.

Maj. Samuel J. Randall to Fort Thomas, Ky., for duty.

Maj. Richard B. Clark to Walter B. Reed, General Hospital, D. C., for duty.

The following to Philippine Islands for duty: Maj. Dale E. Repp, Capt. Robert L. Lowry, 1st Lieut. Wm. H. Siefert.

Capt. Arthur G. Buehler to Fox Hills, N. Y. general hospital 41, for duty.

Week ending August 9th.

Lieut.-col. C. W. Lewis, to Central department, for duty.

Lieut.-col. R. W. Pearson, to Camp Gordon.

Capt. Raymond F. Muleahy, to hospital 21, Denver, for further treatment.

Capt. Nathan C. Pickles, to Jefferson Barracks.

Capt. Lawrence K. Anderson, to Fort Benjamin Harrison.

Navy Dental Corps.

Week ending July 19th.

Lieut. (Jn.Gr.) William H. Wood, detached from duty at the marine barracks, Paris Island, S. C.; to duty aboard the Connecticut.

Lieut. (Jn.Gr.) Alexander L. Keltie, detached from duty aboard the Rhode Island; to duty on the receiving ship at Boston, Mass.

Lieut.-commander Hugh T. Meyers, detached from U. S. S. Dixie; to naval training station, naval operating base, Hampton Roads, Va.

Lieut.-commander Lucian Williams, detached from Naval Academy; to U. S. S. New Mexico.

Lieut. Hubert F. Delmore, detached from U. S. S. Mexico; to U. S. S. Dixie.

Lieut. Arthur H. Yando, detached from receiving ship at Philadelphia; to U. S. S. Rhode Island.

Lieut. Daniel A. Doherty, detached from the Virginia; to duty on the Florida.

Lieut. (Jn.Gr.) Patrick W. Fitzpatrick; detached from duty on the Nebraska; to duty on the Kroonland.

Lieut. Chester H. Webber, detached from duty on the Kroonland; to duty on the Nebraska.

Lieut. Errol W. Willett, detached from U. S. S. Florida; to U. S. S. Virginia.

Lieut. Joseph A. Tartre, detached from U. S. S. Chicago; to U. S. S. Comfort.

Lieut. (Jn.Gr.) Fred W. Mitchell, detached from duty at naval hospital, Fort Lyon, Colo.; to duty at naval training station, San Francisco.

Lieut. (Jn.Gr.) Edwin N. Cochran, detached from duty at naval training station, San

Francisco; to duty at naval hospital, Fort Lyon, Colo.

Lieut. Wm. F. Baron, detached from duty on receiving ship at New York; to duty on the Missouri.

Lieut. Eugene L. Walter, detached from transport forces, to U. S. S. American.

Lieut. Samuel Kalison, detached from duty at naval air station, Chatham, Mass.; to duty at naval training station, Newport, R. I.

Lieut. Glen S. Phillips, detached from receiving ship at New York; to naval hospital, Ward's Island, N. Y.

Week ending July 26th.

Lieut. (Jn.Gr.) Charles S. Weigester, U. S. naval training station, Newport, R. I.; on duty in medical office.

Lieut. (Jn.Gr.) Charles A. Tiley, U. S. naval training station, Newport, R. I.

Lieut. Hyman Mann, detached from naval training station, Hampton Roads; to U. S. S. Pueblo.

Lieut. Philip H. MacInnis, detached from naval training station, Newport, R. I.; to U. S. S. Oklahoma.

Lieut. Clarence A. Chandler, detached from naval training station, Great Lakes; to naval training station, Hampton Roads.

Lieut. Kemper K. Weaver, detached from U. S. S. Oklahoma; to naval training station, Great Lakes, Ill.

Lieut. Hubert F. Delmore, detached from U. S. S. Dixie; to U. S. S. Seattle.

Lieut. Clark E. Morrow, detached from U. S. S. Seattle, to U. S. S. Dixie.

Lieut. Wm. F. Baron, receiving ship, New York; modification of orders of July 9; to duty at Wissahickon Barracks, Cape May, N. J.

Week ending August 2d.

Lieut. Samuel Kalison, detached from Newport, to duty at the naval torpedo station, Newport, R. I.

Lieut. Allen H. Hetler, detached from the navy yard, Philadelphia; to duty on the receiving ship at Philadelphia.

Week ending August 9th.

Lieut. Edw. J. Fitzgerald, detached from Rijndam; to naval training station, Newport, R. I.

Lieut. Jas. F. McGrath, detached from U. S. S. Zealandia; to U. S. S. Dixie.

Lieut. Eris G. Hoylman, detached from naval torpedo station, Newport, R. I., to marine guards, Managua, Nicaragua.

Lieut. (Jn.Gr.) Arthur V. Jolliffe, detached from Louisiana; to marine barracks, Paris Island.

Lieut. (Jn.Gr.) Henry R. Delaney, detached from Frederick; to naval hospital, New York.

Lieut. Louis Wolf, report to Prinz Frederic Wilhelm for one voyage.

Appointments.

Week ending July 19th.

Dental Surg. Edwin N. Cochran, N. R. F., to be an assistant dental surgeon.

The following officers of N. R. F. assistant dental surgeons from June 15th: N. S. Duggan, W. J. Rogers, C. H. Webber, M. P. Kane, C. E. Detmer, F. B. Ferrill, H. S. Hursh, H. C. Miller, A. C. Tranchina, E. B. Howell, P. H. MacInnis, D. A. Doherty, G. S. Maynard, J. E. Sullivan, A. C. Tollinger, E. Laughlin, J. A. Waters, E. J. Fitzgerald, C. B. Morse, B. H. Barton, T. W. Spear, and J. J. Spring.

Week ending August 9th.

The following officers of N. R. F. to be assistant dental surgeons: Roland W. Quesinberry, Edward J. Noonan, Chas. W. Rodgers, Pyrlle A. Fowler, Frank V. Davis, Benjamin F. Loveall, and Walton C. Carroll.

Preparedness League of American Dentists.

ORGANIZED UNDER THE AUSPICES OF THE N. D. A.

The French-Belgian Dentists' Relief Fund.

FROM PRESIDENT BEACH.

THE French-Belgian fund for dentists is gradually increasing, and the League is confident of united support from organized dentistry as soon as the fall meetings begin.

Dr. Georges Villain, Dr. W. S. Davenport, and Dr. Richard Burkhart have been appointed as a commission to represent American dentists in conjunction with l'Aide Confraternelle, for the careful and judicious disbursement of the funds. We feel sure this action will meet with your hearty approval.

We are receiving lists of instruments and materials donated by dentists, and wish to thank all those who have thus far responded. Such lists should be sent to the office of the President, 131 Allen st., Buffalo, N. Y. (For fuller details see July COSMOS, page 700.)

We are in receipt of the letters given below, which are self-explanatory and must impress us more deeply with the merits of the movement.

Additional contributions are as follows: Dr. Jas. Hasbrouck, New York, \$5.00; New Hampshire State Dental Society, \$300.00.

J. W. BEACH, *President*.

LETTERS FROM OFFICERS OF L'AIDE CONFRATERNELLE.

My dear Colleague,—You have been so kind as to inform me of the desire of the Preparedness League of American Dentists to give its help to l'Aide Confraternelle.

I submitted your letter to the officers of this association, of which I am only the treasurer. My colleague, M. Barden, secretary-general, sends you herewith a personal letter of thanks.

I beg you to note that all funds should be sent to "M. FONTANEL, Trésorier, 1, rue Vercingetorix, Paris," by money order or by check on a French bank or on a branch of an American bank in France.

I would appreciate it very much if you would send me, in one of the ways mentioned above, the \$650.00 which you tell me you have at my disposal.

Please accept my personal thanks together

with those of the Committee of l'Aide Confraternelle.

Yours very sincerely,

M. FONTANEL.

PARIS, June 23, 1919.

My dear Colleague,—It is with great pleasure that the officers of l'Aide Confraternelle heard of your intention to collect funds for our work. It is true that our association is in need of a considerable financial effort. After having, during the hostilities, helped the wives of our colleagues who were in need of assistance, refugees, and widows with their families, it has at the present moment numerous problems to consider. These problems are the following:

- (1) Reconstitution of the professional material stolen by the invader.
- (2) Establishment of funds, in some instances, for the benefit of colleagues who have suffered losses, allowing them to make a new start and be ready for patients.
- (3) Temporary help for the education of orphans.
- (4) Permanent help for widows of colleagues killed during the war.

Such are the main points to which the attention of our association is called. You can therefore realize what large resources are needed—which is why at the beginning of this letter I noted with great pleasure your intention to contribute to our work.

Though we are in great need of funds, and though the money you have already collected and will collect will be most welcome, there is a particular way in which your powerful association could give us efficient help—namely, for the reconstitution of professional material. The American military dentists came over with large material, always of first quality and sometimes costly. What does the American Government intend to do with this material, which is in good condition? I believe your association could take the necessary steps to induce the American Government to make it over to the Preparedness League of American Dentists, which could

afterward give it to l'Aide Confraternelle. Thus the most difficult problem of the present time, the reconstitution of professional material, would be solved. I would be greatly obliged if you would study this question and let us know as soon as convenient if anything can be done in this matter.

Please express the sincere thanks of the officers of l'Aide Confraternelle to all members of your League for the great help which you offer to give us, and which will be highly appreciated by our Belgian and French colleagues.

J. L. A. BARDEN.

Paris, June 24, 1919.

FROM THE TREASURER.

SUBSCRIPTIONS to date—Fund for the Relief of French and Belgian Dentists:

Subscriptions to June 15, previously reported	\$2305.00
J. F. Hasbrouck, New York City	5.00
W. A. Spring, New York City	25.00
New Hampshire State Dental Society	300.00

Total \$2635.00

Notification has been received from several state societies of subscriptions having been voted, but the amounts have not as yet reached this office.

There is also over \$3000 in the General and Ambulance funds of the Preparedness League.

Respectfully submitted,

L. M. WAUGH, *Treasurer.*

SOCIETY NOTES AND ANNOUNCEMENTS

Coming Dental Society Meetings.

With the National Dental Association at New Orleans.

NATIONAL DENTAL ASSOCIATION. New Orleans. October 20th to 24th.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS. New Orleans. October 18th to 20th.

NATIONAL ASSOCIATION OF DENTAL FACULTIES. New Orleans. October 18th to 20th.

AMERICAN ACADEMY OF PERIODONTOLOGY. New Orleans. October 17th and 18th.

AMERICAN SOCIETY OF EXODONTISTS. New Orleans. October 21st.

INTERNATIONAL SOCIETY OF PROSTHETISTS. New Orleans. October 17th and 18th.

ASSOCIATION OF MILITARY DENTAL SURGEONS. New Orleans. October 20th to 24th.

CONFERENCE OF PUBLIC SCHOOL DENTISTS. New Orleans. October 20th to 24th.

DELTA SIGMA DELTA FRATERNITY. New Orleans. October 20th.

PSI OMEGA FRATERNITY, GRAND CHAPTER AND NATIONAL ALUMNI CHAPTER. New Orleans. October 20th to 24th.

Xi PSI PHI FRATERNITY. New Orleans. October 20th to 24th.

State Society Meetings.

SEPTEMBER.

NEW ENGLAND DENTAL SOCIETY. Boston. September 3d to 5th.

NORTHERN INDIANA DENTAL SOCIETY. Muncie. September 10th and 11th.

TENNESSEE STATE DENTAL ASSOCIATION. Nashville. September 4th to 6th.

OCTOBER.

NORTHERN ILLINOIS DENTAL SOCIETY. Rockford. October 8th and 9th.

SUSQUEHANNA DENTAL ASSOCIATION OF PENNSYLVANIA. Scranton. October 8th to 10th.

Examiners' Meetings.

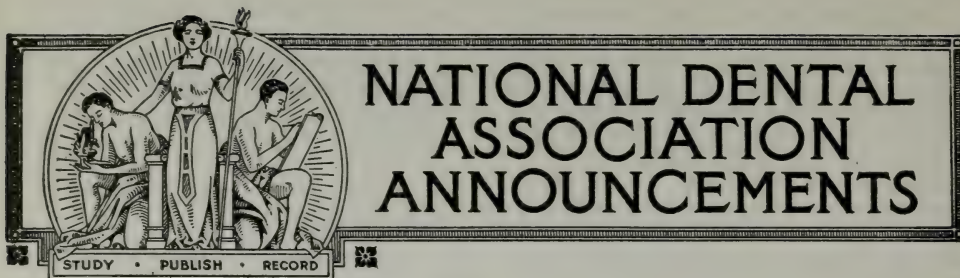
IOWA BOARD OF EXAMINERS. Iowa City. October 6th.

MASSACHUSETTS BOARD OF EXAMINERS. Boston. October 6th to 10th.

NEW JERSEY BOARD OF REGISTRATION. Trenton. December 1st to 5th.

NEW YORK BOARD OF EXAMINERS. September 2d and November 11th.

RHODE ISLAND BOARD OF REGISTRATION. Providence. November 4th to 6th.



Twenty-third Annual Meeting, held at New Orleans, October 20-24, 1919.

NEW ORLEANS: ITS PISCATORIAL PULL.

MEMBERS of the National Dental Association fond of fishing had better bring their strongest rods and reels to New Orleans when they come to the National Convention, October 20-24, 1919. The waters surrounding New Orleans are teeming with edible fish from the aristocratic and palatable pompano and mackerel to the plebeian and coarser textured catfish and chopique.

"Spend your vacation in New Orleans in October!" is a slogan the General Convention Committee has adopted in urging members to be here for the big meeting. It is understood many will follow this plan. The Indianapolis delegation, coming nearly 100 strong, have announced they intend to fish and enjoy life generally. This does not mean they will pass up the convention; they intend to take to the great outdoors after the meeting is adjourned.

October is an ideal fishing month around New Orleans. The city is surrounded by lakes, bayous, passes, and other forms of water easily reached by railroad. All of the fishing resorts boast clubs at which fishermen can obtain live bait, tackle, food, motor launches, and other things that go with a day on the water.

Steps have been taken by the State Conservation Commission to preserve fishing for the whole state. This does not mean that fishing is restricted. Their rules apply principally to commercial fishing, the sportsman having ample leeway to catch as many as he likes.

In addition to the speckled trout, redfish,

buffalo, drum, croakers, and sheephead, the waters abound in sharks and tarpon, the latter measuring all the way from 2 to 6 ft. and weighing from 10 to 200 lb. The tarpon feed on mullet, lying in wait two feet under the surface until a school appears overhead. The tarpon then jumps and splashes, killing mullet right and left. This provides his feast. As all fishermen know, the tarpon is a fighter, and many are the memorable battles that have been staged in Louisiana waters. The guide of the Winchester Club at Lake Catherine, only a few miles from the city, has for a trophy a tarpon measuring 6½ ft. He landed the monster in twenty minutes with ordinary reel and rod.

When it comes to fish stories, nearly every sportsman in New Orleans can spin them. For instance, Dr. Joseph P. Wahl, general chairman of the Local Committee, recently visited Mississippi Sound, where he caught five redfish averaging 5 lb. in about five minutes. "They were grabbing the hook before it hit the bottom!" he declared. Not to be outdone, another member of the committee told how he caught a number of 15-lb. drums off Deere Island, a famous Government game preserve.

One of the favorite methods of fishing is to "bait the hole" the night before. Clams are generally used for this, the bait attracting sheepheads. One fisherman who recently visited Chef Menteur baited a hole the night before and went out early next morning. He caught 30 sheepheads weighing all the way from 1 to 5 lb.

Among the famous fishing-holes within a few minutes' ride of the city are Lake Pontchartrain, the Rigolets, Lake Catherine, Little Woods, Chef Menteur, South Point, Biloxi, Pass Christian, Bay St. Louis, Ycloskey, Mandeville, Milneburg, Spanish Fort, West End, Lake Borgne, and other places too numerous to mention.

New Orleans, the largest sea-food market in the world, also is famous for its oysters. It has been said by visitors that the oysters sold in New Orleans have a much richer flavor than the famous Chesapeake Bay product. However, this is a point for discussion among oyster consumers.

Soft-shell crabs, frogs, shrimp, clams, and hard-shell crabs are plentiful in New Orleans, and occupy a prominent place on all menus. Those who like sea food will make no mistake by coming to New Orleans whether they are able to go out and catch it or not.

"They'll be bitin', boys; come along!" is the word the Local Committee sends out.

Leading New Orleans Hotels and Their Rates.

S = Single, without bath. *Sb* = Single, with bath.
D = Double. " " *Db* = Double, " "

GRUNEWALD HOTEL (University Place, off Canal st.): *S* \$1.50, for two \$2.50 and up. *Sb* \$3.00, for two \$4.00 and up, *D*, for one \$2.00, for two \$3.00 and up. (Rms. 500.)

ST. CHARLES HOTEL (St. Charles and Gammon sts.): *S* \$2.00 to \$3.50, *Sb* \$3.00 to \$7.00, *D* \$4.00 to \$6.00, *Db* \$5.00 to \$10.00; parlor, bedroom, and bath \$10.00 to \$25.00 per day. (Rms. 500.)

HOTEL MONTELEONE (Royal and Iberville sts.): *S* \$1.50 and up, *Sb* \$2.50 and up, *D* \$2.50 and up, *Db* \$3.50 and up. (Rms. 500.)

HOTEL DE SOTO (Baronne and Perdido sts.): *S* \$1.50 and up, *Sb* \$2.50 and up, *D* \$2.50 and up, *Db* \$3.50 and up. (Rms. 300.)

COSMOPOLITAN HOTEL (120 Bourbon st.): *S* \$1.00 and up, *Sb* \$2.00 and up, *D* \$2.00 and up, *Db* \$3.00 and up. (Rms. 100.)

LAFAYETTE HOTEL (St. Charles and Lafayette sts.): *S* \$1.50 and up, for two \$2.50 and up, *Sb* \$2.00 and up, for two \$3.00 and up, *Db* (twin beds) \$5.00 and up. (Rms. 80.)

PLANTERS HOTEL (Dauphine and Iberville sts.): *S* \$1.00 and up, *Sb* \$2.00 and up, *D* \$2.00 and up, *Db* \$3.50 and up. (Rms. 75.)

The Program.

PRELIMINARY ANNOUNCEMENT.

IN THE SECTIONS.

Orthodontia and Periodontia.

TUESDAY, 2 P.M.

"An Analysis of the Various Principles of Orthodontic Treatment that have been Advocated during the Last Fifteen Years." By J. A. Cameron Hoggan, Richmond, Va.

"Necessity for Oral Prophylaxis and Radiology in the Practice of Orthodontia." By F. M. Casto, Cleveland, Ohio.

"Observations upon the More Recent Developments in Periodontology." By Arthur H. Merritt, New York, N. Y.

"Why the Field of Prophylaxis is Marked with a Lack of Enthusiasm." By Dorothea A. Howes, Washington, D. C.

WEDNESDAY, 9 A.M.

"Plurality in Etiology of Periodontoclasia." By John O. McCall, Buffalo, N. Y.

"What to Extract, and What Not to Extract, with Reference to Infections Involving the Periodontal Membrane." By Louis D. Coriell, Baltimore, Md.

"An Analysis of Case Characteristics, with Reference to the Selection of the Most Efficient Form of Appliance for Treatment." By A. H. Ketcham, Denver, Colo.

"The Problem of Retention." By C. A. Hawley, Washington, D. C.

Operative Dentistry, Materia Medica, and Therapeutics.

FIRST SESSION.

"The Prevention of Chronic Mouth Infection." (Illustrated with stereopticon slides.) By Arthur D. Black, Chicago, Ill. Discussed by H. E. Friesell, Pittsburgh, Pa.; A. H. Hipple, Omaha, Neb.

[This paper will consider briefly the pathological changes which occur in cases of chronic alveolar abscess and chronic pericementitis, and will then discuss the causes and take up in detail the methods to be employed in operative dentistry for their prevention. Extensive studies of radiographs of root-fillings will be reported, and means of simplifying

pulp treatment and root-canal technique will be presented. Particular stress will be laid upon improvements in operative procedures to prevent peridental infection.]

"X-ray in Dental Practice." By C. Edmund Kells, New Orleans, La. Discussed by H. B. Tileston, Louisville, Ky.; Howard R. Raper, Albuquerque, N. M.

SECOND SESSION.

"Some Recommendations for the Sterilization and Filling of Infected Roots." By Weston A. Price, Cleveland, O. Discussed by Clarence J. Grieves, Baltimore, Md.; Percy R. Howe, Boston, Mass.

"The Gold Inlay." By R. H. Volland, Iowa City, Iowa. Discussed by Wallace Wood, New Orleans, La.; W. L. Fickes, Pittsburgh, Pa.

Histology, Physiology, Pathology, Bacteriology, and Chemistry — Research.

FIRST SESSION.

"How Mouth Infection Affects the Kidneys." By Thomas B. Hartzell, Minneapolis, Minn.

"A Phase of Dental Caries." By Percy R. Howe, Boston, Mass.

"A Biochemical Study of Bacterial Metabolism in Its Relation to the Denser Tooth Structures." By Samuel E. Pond, Cleveland, Ohio.

SECOND SESSION.

"A Dental Histo-Pathological Study." By Harold Box, Toronto, Canada.

"Physiology and Pathology of Special Interest to Dentists." By J. J. Sarrazin, New Orleans, La.

"Studies of the Variations in Susceptibility to the (So-called) Rheumatic Group Lesions and to the Influence of Oral Focal Infections." By Weston A. Price, Cleveland, Ohio.

Prosthetic Dentistry and Crown and Bridge Work.

Special Announcement.

Owing to the fact that only two half-day sessions can be given to this section, it has been deemed best to dispense with long, exhaustive general papers and discussions, as more definite information can be given by selecting men to cover as many of the vital phases of this branch of dentistry as possible,

with a view to standardizing technical procedure. The audience will thus individually have the opportunity of either accepting or rejecting the teachings of the essayists.

In addition to the papers and illustrations, the essayists will give individual clinics in order that those who desire to meet and discuss details further with the clinicians may have this opportunity.

FIRST SESSION.

PROSTHODONTIA.

"Scientific Interpretation of Muscular Control of Mandibular Movements." By Geo. H. Wilson, Cleveland, O.

[The dental profession and anatomists generally are not clear on this subject. Dr. Wilson has been doing research work along this line for some years, and is now ready to present his findings to the profession. Owing to the importance of this subject in its relation to denture construction we are fortunate to have it presented to us by a man of Dr. Wilson's ability and experience.]

"Surgical Interference for Preparation of Malformed Edentulous Mouths for Construction of Dentures." By James P. Ruyl, New York City.

[Demonstrates technique, using motion pictures, for removing protruding gum tissue, irregular alveolar process, and other deformities, in order to simplify complicated cases by providing a firm foundation upon which to build artificial dentures that will be more efficient and more beautiful.]

CROWN AND BRIDGE TECHNIQUE.

"Construction of Cast Clasps for Partial Dentures and General Consideration of Other Methods of Retention and Attachment of Vital Teeth for Removable Bridge Work." By Louis J. Weinstein, New York City.

[Mr. Weinstein's knowledge of the uses and abuses of metals used in dentistry, combined with his technical experience, enables him to present us with definite information on a subject of vital importance at this time.]

"Porcelain Jacket Crown Technique." By A. L. Legro, Detroit, Mich.

[Demonstrates a definite technique for making this most esthetic as well as most valuable prosthetic restoration for the conser-

vation of the dental pulp comparatively simple.]

SECOND SESSION.

PROSTHODONTIA.

"Selection of Artificial Teeth for Prosthetic Restorations." By P. C. Lowery, Detroit, Mich.

[Clearly demonstrates one of the most important phases of dentistry which a large majority of dentists do not seem to appreciate as much as they should. The doctor shows that it is much simpler to harmonize tooth and face form than it is to adapt the face of your patients to your ideal tooth form.]

"Correction of Malocclusion in Artificial Dentures." By M. M. House, Indianapolis, Ind.

[Demonstrates with precision the highest type of efficiency in artificial dentures.]

CROWN AND BRIDGE TECHNIQUE.

"The Gold Shoulder Crown Technique." By Wm. H. Elliott, Detroit, Mich.

[This technique of the most widely used restoration in dentistry is definite, accurate, and simple.]

"Attachments for Vital Teeth in Fixed Bridge Work." By Forrest H. Orton, St. Paul, Minn.

[Dr. Orton's reputation as a technician and teacher of teachable techniques is so great that no dentist can afford to miss an opportunity to hear him lecture.]

"Mandibular Movements and the Forms of Artificial Bicusps and Molars Necessitated Thereby." By Prof. Alfred Gysi, Zurich, Switzerland.

"Mandibular Control." By J. Leon Williams, New York City.

Oral Surgery, Exodontia, and Anesthesia.

FIRST SESSION.

Symposium on Apicoectomy.

1. "Apicoectomy: Its Indications and Contra-indications, and Root-canal Technique." (Illustrated with stereopticon slides.) By Thomas B. Hartzell, Minneapolis, Minn.

2. "Surgical Technique of Apicoectomy." (Illustrated with stereopticon slides.) By Chalmers J. Lyons, Ann Arbor, Mich.

Discussed by Thomas P. Hinman, Atlanta, Ga.; William L. Shearer, Omaha, Nebr.; Carl D. Lucas, Indianapolis, Ind.; Clarence J. Grieves, Baltimore, Md.; H. A. Maves, Minneapolis, Minn.

"Nitrous Oxid-Oxygen Anesthesia in Oral Surgery and Dentistry." By J. A. Heidbrink, Minneapolis, Minn. Discussed by Wm. H. Deford, Des Moines, Iowa; John W. Seybold, Denver, Colo.; Boyd S. Gardner, Rochester, Minn.

"Tic douloureux; Etiology, Diagnosis, Treatment—Palliative, Blocking, and Surgical." By Rudolph Matas, M.D., New Orleans, La. Discussed by Herbert A. Potts, Chicago, Ill.

SECOND SESSION.

"Impacted Lower Third Molar." (Illustrated.) By Geo. B. Winter, St. Louis, Mo. Discussed by J. P. Henahan, Cleveland, O.; Harry W. Allen, Kansas City, Mo.; O. T. Dean, Seattle, Wash.; Roy S. Hopkinson, Milwaukee, Wis.

Symposium on Nerve-blocking Anesthesia.

"Preparation of Solution." By E. A. Litchfield, Humboldt, Nebr.

"Pharmacology of Various Local Anesthetics." By Samuel L. Silverman, Atlanta, Ga.

"Indications and Contra-Indications." By Fred F. Molt, Chicago, Ill.

"Technique of Nerve-blocking." (The most important injections.) By ———

"Suggestive Therapy and Treatment of Abnormal Conditions During and Following Injections." By P. G. Puterbaugh, Chicago, Ill.

"Diseases of the Antrum." (Illustrated with stereopticon slides.) By Chas. H. Oakman, Detroit, Mich. Discussed by R. Boyd Bogle, Nashville, Tenn.; Truman W. Brophy, Chicago, Ill.

[AT NEW ORLEANS.]

American Society of Exodontists.

THE next annual meeting of the American Society of Exodontists will be held in parlor E of the Grunewald Hotel, New Orleans, October 21, at 8 P.M.

C. F. B. STOWELL, Sec'y,
Chicago, Ill.

[AT NEW ORLEANS.]

International Society of Prosthetists.

THE first annual meeting of the International Society of Prosthetists will be held in New Orleans, La., October 17 and 18, 1919.

Preliminary meetings looking toward the organization of this body were held during the Chicago meeting of the National last year, when the following officers were elected: W. A. Giffen, Detroit, president; Russell W. Tench, New York, treasurer; Dayton D. Campbell, secretary.

DAYTON D. CAMPBELL, *Sec'y*,
Kansas City, Mo.

[AT NEW ORLEANS.]

National Association of Dental Faculties.

THE annual meeting of the National Association of Dental Faculties will be held in parlor E, mezzanine floor, the Grunewald Hotel, New Orleans. The meeting will be called on Saturday, October 18th, at 9 A.M., and will last through Monday.

C. C. ALLEN, *Sec'y*.

[AT NEW ORLEANS.]

Delta Sigma Delta Fraternity.

THE thirty-fifth annual meeting of the Supreme Chapter of Delta Sigma Delta Fraternity will be held in the Elks' new lodge hall (which is about three blocks from the headquarters of the Fraternity, New Orleans, La., on Monday, October 20, 1919, at 9 A.M.

The regular order of business will be pursued, including action on the proposed amendments to the constitution and by-laws, to be followed by initiatory exercises in the afternoon.

Headquarters of the Fraternity will be in the Grunewald Hotel. The annual banquet will be held in the Elks' new lodge hall at 7 P.M. Those expecting to attend the banquet will greatly facilitate the work of the committee by making their presence known as early as possible on the day of the meeting.

By order of the Supreme Chapter.

CARL D. LUCAS, *Supreme Grand Master*,
R. HAMILL D. SWING, *Supreme Scribe*,
1623 Walnut st., Philadelphia. Pa.

[AT NEW ORLEANS.]

American Academy of Perio- dontology.

THE sixth annual meeting of the American Academy of Periodontology will be held in New Orleans, October 17 and 18, 1919. Headquarters Hotel Grunewald.

An instructive program is being prepared for members as well as all dentists interested in the development of periodontia.

GRACE R. SPALDING, *Sec'y*,
803 Empire Building, Detroit, Mich.

[AT NEW ORLEANS.]

Conference of Public School Dentists.

A SPECIAL conference of dentists operating in school dental dispensaries and of persons interested in such work is to be held in New Orleans at the time of the National Dental Association meeting, October 20 to 24, 1919.

At a similar meeting held June 13th at Syracuse, during the New York State Dental Society meeting, so much interest was shown that a committee was named, and instructed to call this national conference.

All persons interested are requested to extend their suggestions or questions to the committee.

WM. H. LEAK, *Chairman*,
Oral Hygiene Inspector,
N. Y. State Dep't Education.
S. R. MEAKER, Auburn, N. Y.
ERWIN SCHEID, Chazy, N. Y.,
Dental Director, Chazy Central Rural School.

[AT NEW ORLEANS.]

Association of Military Dental Surgeons.

THE Association of Military Dental Surgeons of the United States will hold its annual meeting at New Orleans, October 20 to 24, 1919.

The officers of the Association of Military Dental Surgeons for the ensuing year are as follows: F. P. R. Ryan, president; J. L. Brown, vice-president; R. W. Waddell, secretary-treasurer; Wm. C. Fisher, editor. Council members—John D. Millikin and Wm. C. Fisher

R. W. WADDELL, *Sec'y*,
New York, N. Y.

Tennessee State Dental Association.

THE fifty-second annual meeting of the Tennessee State Dental Association will be held at the Hotel Hermitage, Nashville, September 4, 5, and 6, 1919.

From all appearances our program promises the greatest meeting ever.

JAS. J. VAUGHN, *Ch. Publicity Com.*,
Nashville, Tenn.

Northern Indiana Dental Society.

THE thirtieth annual meeting of the Northern Indiana Dental Society will be held at Muncie, Ind., on Wednesday and Thursday, September 10 and 11, 1919. A cordial invitation is extended to all ethical dentists to be present.

EARL BROOKS, *Acting Sec'y*,
Noblesville, Ind.

New England Dental Society.

FORMERLY NORTHEASTERN DENTAL
ASSOCIATION.

THE New England Dental Society, formerly the Northeastern Dental Association, will hold its twenty-fifth annual meeting in Boston, Mass., on September 3, 4, and 5, 1919, at the Somerset Hotel.

ALVIN A. HUNT, *Sec'y*, Hartford, Conn.

Northern Illinois Dental Society.

THE thirty-second annual meeting of the Northern Illinois Dental Society will be held at Rockford, Ill., on Wednesday and Thursday, October 8 and 9, 1919.

A cordial invitation is extended to ethical practitioners of dentistry.

R. P. CULVER, *Sec'y*, DeKalb, Ill.

Susquehanna Dental Association of Pennsylvania.

THE fifty-fifth annual meeting of the Susquehanna Dental Association will be held at Hotel Casey, Scranton, Pa., October 8, 9, and 10, 1919.

As the members of the association all remember, this meeting was to have been held at the same time and place last fall, but on account of the influenza epidemic it had to be canceled, and it was arranged to be held in October so as not to interfere with the April meeting of the State Society at Pittsburgh.

The executive committee are working out plans to make this the best meeting in the history of the association. It is going to be one of those good old-fashioned meetings that no one can afford to miss.

Further details will follow, but we give you this friendly little tip now—that it is going to be somewhat along the postgraduate line, some of the biggest men in the profession having already been retained. We will make it well worth the trip.

J. P. COULT,
E. L. BROWN,
J. B. TWEEDLE, *Com.*

New Jersey Board of Registration.

THE State Board of Registration and Examination in Dentistry of New Jersey will hold their regular examination in the Statehouse, Trenton, N. J., December 1 to 5, 1919. License fee, \$26, re-examination fee, \$10.

Practical tests required: Insertion of an approximal gold filling with the approximating tooth in position, compound approximal amalgam filling, a silicate filling, practical test of applicant's ability in oral prophylaxis, and preparation of cavity for an inlay with wax pattern. Taking of impression, bite, selection of teeth, articulation, trial plate. Soldering of Richmond crown, which must be made from an impression of the mouth, and the articulating model with the crown, when soldered, must be submitted for inspection. Practical examination in mouth diagnosis.

Attention is directed to the following quotation from the dental law of New Jersey: "Applicant shall present to said board a certificate from the commissioner of education of this state, showing that before entering a dental college he or she had obtained an academic education consisting of a four-year course of study, or the equivalent thereof." In accordance with this law the secretary will issue application blanks only upon presentation of the required certificate from the commissioner of education, Statehouse, Trenton, N. J.

Applications must be filed complete ten days before the date of the examinations. Address all communications for further particulars to

JOHN C. FORSYTH, *Sec'y*,
435 E. State st., Trenton, N. J.

Iowa Board of Examiners.

THE Iowa State Board of Dental Examiners will meet for the purpose of examining candidates for license to practice in Iowa, at Iowa City, College of Dentistry, beginning Monday, October 6, 1919, at 9 A.M.

For further information and blanks address

C. B. MILLER, *Sec'y*,

605 Cit. Nat'l Bank Bldg., Des Moines, Iowa.

Massachusetts Board of Examiners.

A MEETING of the Massachusetts Board of Dental Examiners for the examination of candidates for registration will be held in Boston, Mass., October 6 to 10, 1919, inclusive. All applications must be filed, complete, with the secretary ten days before the date of the examination.

For further information address

GEORGE H. PAYNE, *Sec'y*,

29 Commonwealth ave., Boston, Mass.

Rhode Island Board of Registration.

THE regular semi-annual meeting of the Rhode Island Board of Registration in Dentistry for the examination of applicants will

be held in the State-house, Providence, R. I., November 4, 5, and 6, 1919. All applications with proper fee must be filed one week previous. For further information address

E. A. CHARBONNEL, *Sec'y*,

334 Westminster st., Providence, R. I.

New York State Examinations in Dentistry.

POSTPONEMENT BY THE BOARD OF REGENTS.

Abstract: Because of interference with the course of instruction, caused by the emergent inauguration of the Students Army Training-corps in connection with dental schools,

* * * * *

it has been formally decided by the Board of Regents to postpone the June dental examination until the first Tuesday of September, and the September examination until the second Tuesday of November.

There was therefore no June dental examination held in this state in 1919, but this will not affect examinations in subsequent years.

AUGUSTUS S. DOWNING,

Assist. Commissioner of Education.

UNITED STATES PATENTS PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING JULY 1919.

July 1.

No. 1,308,038, to IRA A. BURNETT. Dental amalgam mixer.

No. 1,308,251, to SIMON MYERSON. Method of making seamless stemmed metal plates.

No. 1,308,374, to PUIS J. ROTH. Toothbrush.

July 8.

No. 1,308,866, to WM. T. REMINGER. Rotary toothbrush.

No. 1,309,127, to THOS. F. GLENN. Method of producing artificial teeth.

July 15.

No. 1,309,686, to JAY A. HEIDBRINK. Anesthetic apparatus.

No. 1,310,014, to WM. O'HALLORAN. Tool for forming cervical fillings.

No. 1,310,089, to GEORGE W. RHODES. Toothbrush and tooth-paste holder.

No. 1,310,237, to ELIAS T. GOLDBERG. Artificial tooth.

July 22.

No. 1,310,654, to GEORGE W. GRIMM. Artificial teeth.

No. 1,310,901, to VIGO V. J. ANDRESEN. Method of making dental cements.

July 29.

No. 1,311,414, to JULIUS C. OSHER. Dentists' and jewelers' tool.

No. 1,311,790, to MILTON ALDEN. Illuminating appliance.





DR. CHAS. KING VAN VLECK.

THE DENTAL COSMOS

VOL. LXI.

OCTOBER 1919.

No. 10

ORIGINAL COMMUNICATIONS

Histo-pathology of the Jaws and Apical Dental Tissues.

No. III:

Epithelial Débris Located in the Peridental Membrane and Other Structures.

By EUGENE S. TALBOT, M.D., D.D.S., Chicago, Ill.

BEFORE continuing our studies of the histo-pathology of the jaws and apical dental tissues, we must next consider the development and function of the enamel organ, since it has much to do with the pathology of the apical dental tissues. We are all familiar with the fact that the enamel organ is developed from the mucous membrane of the mouth. At certain points upon the lamina the tissues undergo a change equal to the number of teeth that are to be developed. As these epiblastic buds develop upward and downward into the mesoderm, they enlarge and finally become quite bulbous. As this bulbous portion comes in contact with the dental papilla, it proceeds to cover it as far as the base of the tissue, which has become the starting-point of the fibrous sac or wall.

The sac wall now grows around the

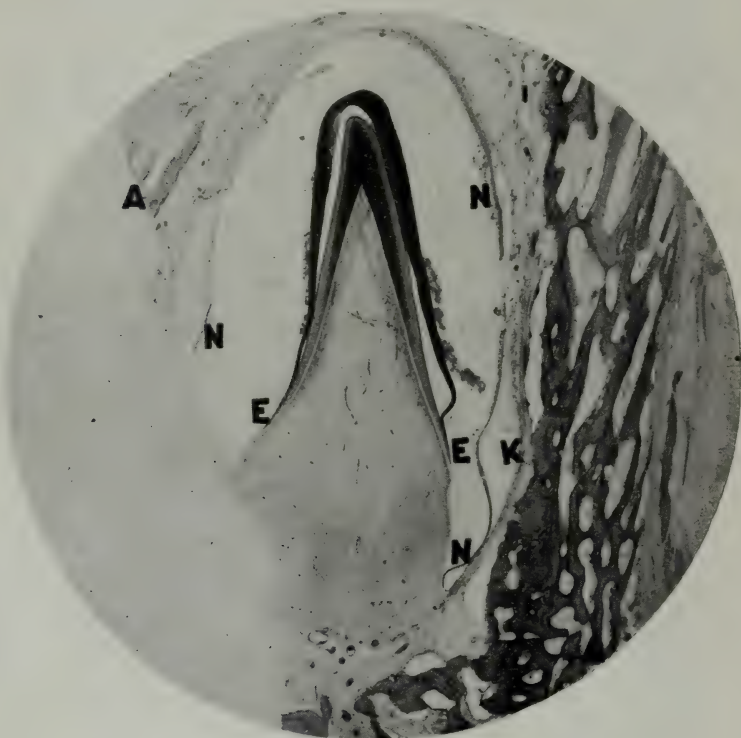
outside of the enamel organ, and the epithelial cord, which united it with the surface, is absorbed away. We now have the two epithelial layers, outer and inner, inclosed within the follicular wall. The inner layer molds itself around the dental papilla, which takes the form of the future tooth. It is from the epithelial cells of this inner layer or tunica that the enamel is formed. We must now fix in our minds the fact that all the structures which go to form the tooth, including the peridental membrane, are included within the sac wall. All the structures, from the cutting and grinding edges of the teeth to and including the apical end of the roots, are developed and completely formed within the sac wall, no matter how many or how long the roots may be.

I believe all writers and research workers are agreed upon these points in this

brief description of tooth development. The nidus of arteries shown in my paper in Figs. 1, 2, and 3, in the September DENTAL COSMOS are always seen at the end of the root. The question now naturally arises, What becomes of the external epithelial layer? Authors differ greatly in regard to the final disposition of this structure. Some dismiss the

when the epithelial cord has finished its course—having conducted the primary enamel organ to that point from which its subsequent evolution will be effected; and soon after, the formation of the secondary follicle immediately after the rupture of the cord of the primitive follicle." They further state: "In fact, as soon as the epithelial lamina

FIG. 1.



(Magn. 13.)

subject without comment, while others state that it is absorbed away before the enamel is formed. These views are not based upon extensive microscopic research.

In 1860,* Robin and Magitot first described epithelial débris. They state: "The phenomena of budding commences

loses its connection with the follicle by the rupture of the cord, the epithelial cells composing it become greatly increased in number at the severed point." It will be seen by this description and by the pictures illustrating their article that these epithelial cells may be located in any part of the alveolar process in the embryonal tissue, outside of the follicular wall, before the bone begins to form.

Black, in his work "Periosteum and Peridental Membrane," published in

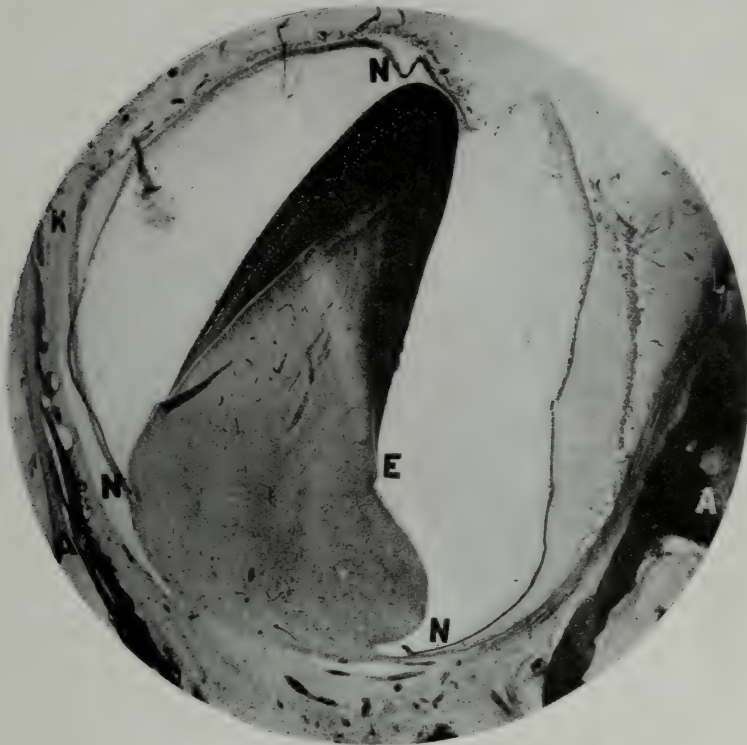
* See their memoir on "The Genesis and Development of the Dental Follicle," *Journal de Physiologie de Brown-Séguard*, 1860.

1887, described the cells as lymphatic structures. He says on page 90: "The peridental membrane has a very peculiar system of cells closely resembling those of the lymphatic. In young subjects these are found in large profusion among its fibers close to the cementum."

In 1899,* the author published the results of an extensive line of research

ous and are better defined in the sheep than in the calf, and more apparent in the canine jaw than in the human. Under higher power they may be distinctly demarcated as epithelial cells arranged in single rows of loops, again in double rows, again in rows of three, and sometimes in round or oblong groups, with clusters of cells without shape or

FIG. 2.



(Magn. 15.)

upon sheep, in which he calls these cells "epithelial débris." He says: "In cross sections of the peridental membrane with a low power may be seen dark bodies arranged along the margin of the cementum in the peridental membrane. They are more numerous, however, near the gingival border than at the root extremity. These bodies are more numer-

form. With a still higher magnifying power it will be seen that these masses of cells are polygonal, never prismatic. Hence they are similar in shape to the epithelial cells situated inside the epithelial lamina. In the larger amplification the nucleus can be readily observed." The author, therefore, was the first to demonstrate the true nature of these bodies, and to give them the name "epithelial débris."

* "Interstitial Gingivitis, or Pyorrhea Alveolaris."

Much discussion has arisen lately as

to the origin of these cells. It has been my good fortune to be able to solve this problem. Naturally, being epithelial in character, they must originally develop from the external epithelium of the mouth. Epithelial débris is found in the peridental membrane throughout the entire length of the root. They are usually more numerous at the cervical

see that the external epithelial layer may remain long after the enamel is fully formed, even up to the time of the eruption of the teeth. We shall also observe that the epithelial cells migrate in all directions into the sac wall, part of which finally becomes the peridental membrane, and that they are also caught in the development of the cementum.

FIG. 3.



(Magn. 18.)

margin, but occasionally are found in greater number of cells at the apical end of the root, especially in sheep.

Since they are located inside of the fibrous sac, they must have entered before it had closed and become the dental follicle, which is the case. This disposes of more than one-half of the difficulty in locating their origin. If, then, they are developed from the enamel organ, how do they reach the peridental membrane, and especially the end of the root? By studying the illustrations we shall

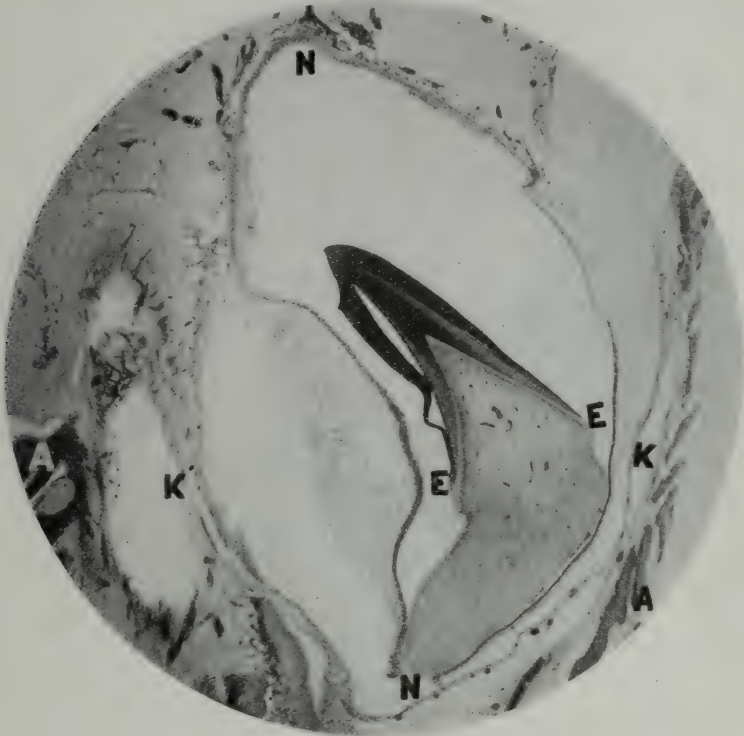
This research work was done upon humans, dogs, sheep, and monkeys. Thousands of sections were cut and hundreds were mounted for microscopic study. The best results are always obtained by getting the material at or soon after birth, when all the teeth are still in the jaw. Histology can best be studied at this time, because both sets of teeth are in different stages of development, and the structures are all held together by the ossification of the jaw.

Fig. 1 shows the development of a

human lower central incisor at birth.* While this specimen was being prepared for the microscope, the posterior part of the alveolar process was destroyed. Enough tissue remains, however, to show the development of the root of the tooth: A is the alveolar process, E end of the enamel, K wall of the sac, N external epithelial layer. The nidus of arteries*

layer. Note that the end of the external layer now rests at the base of the papilla at its junction with the dental sac. Not that the external epithelial layer has grown in length, which it is capable of doing, but in the development of the root of the tooth the crown and the root have grown upward from the base where the arteries are located. At places along

FIG. 4.



(Magn. 16.)

at the base of the papilla is located quite a distance from the neck of the tooth, which marks the location of the sac wall. The root of the tooth has developed nearly one-half its length. The edge of the enamel shows the location of the neck of the tooth. The external epithelial layer originally extended to that locality before severing its connection with the internal

the external epithelial layer dead cells are given off where it does not receive nourishment from the fibrous sac. Quantities of dead cells have migrated from the external epithelium and are located on the enamel on both sides of the crown. Where the external epithelium has obtained its nourishment from the sac wall, the cells are in a comparatively normal healthy condition.

Fig. 2 shows another incisor crown of a child at birth, with the enamel nor-

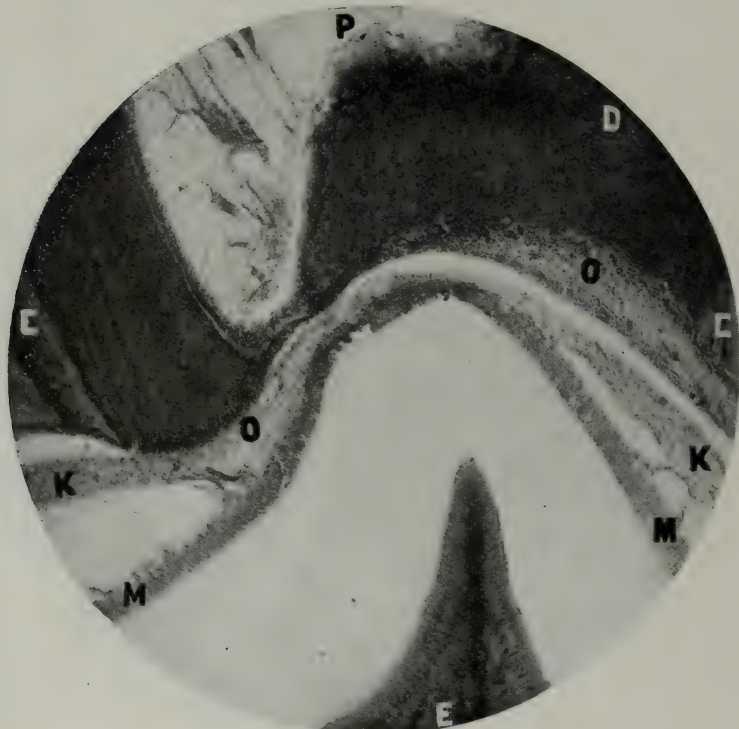
* See also illustrations in article No. II. September DENTAL COSMOS, pp. 827 ff.

mally developed: A is the alveolar process, E the edge of the enamel and neck of the tooth, K fibrous sac inclosing the dental tissue, N outer layer of enamel organ. The internal epithelial layer and the stellate reticulum have entirely disappeared, while the external epithelial layer is still located on the inner surface of the dental sac. The edge of the

however, at the base is readily observed. Like the other pictures,* these arteries were originally located at the base of the crown, as seen in Fig. 1.

The root of the tooth developing from the base has carried the crown of the tooth toward the surface. Hence the difference in location of the ends of the external epithelium and the edge of

FIG. 5.



(Magn. 40.)

enamel both anteriorly and posteriorly is distinctly outlined. The external epithelium has dropped down to the junction of the papilla and the fibrous sac, which is also readily seen. The distance, however, between the end of the external epithelium and the edge of the enamel is quite marked. This is the root of the tooth. Here, again, details are sacrificed to obtain a large area to show the relation of the different tissues to each other. The nest of arteries,

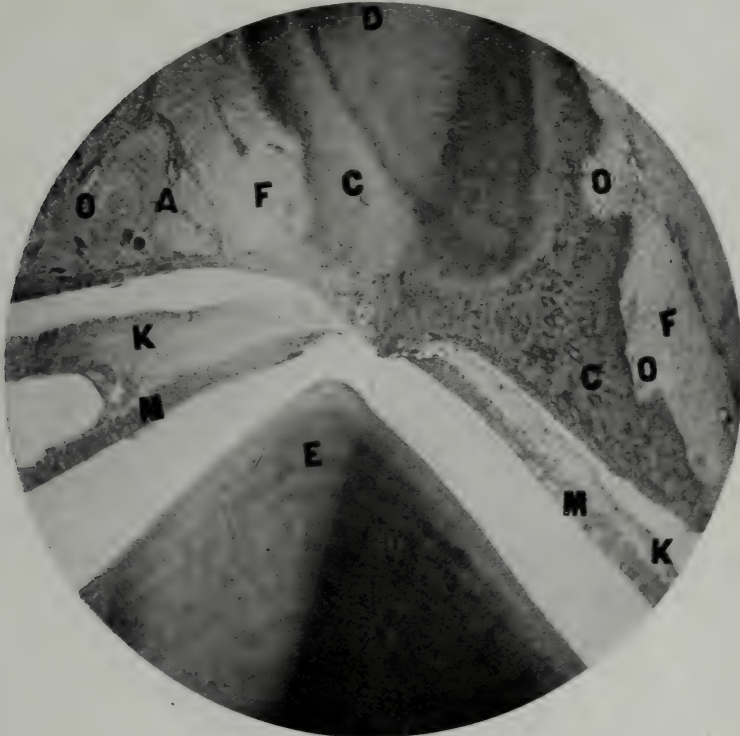
the enamel. It is well to call attention at the present time to the dark spot in the fibrous sac outside the external epithelium. Note that bone has not yet developed at that locality. The part of the external epithelium that is nourished by the fibrous sac sends out healthy normal epithelial cells, which migrate in all directions in the fibrous sac. Sometimes

* See article No. II, in September DENTAL COSMOS.

they are single, sometimes two or more are together and form themselves into different shapes; sometimes they are in rows and sometimes they form cylinders like a gland. These will be shown more clearly later on. Carry in your mind's eye the end of the external epithelium where it turns on itself at right angles

the dead epithelial cells are scattered in the space. At the left the external epithelial layer extends down to the junction of the fibrous sac and the dental papilla. Here again, epithelial cells shown by the dark spot have migrated outside the external epithelium into the fibrous tissue. New bone is developing

FIG. 6.



(Magn. 50.)

at the right of the picture. This locality will be shown by a higher magnification later.

Fig. 3 shows another human tooth, the superior cuspid in a child at birth: A is the forming alveolar process, E the edge of enamel at the neck of the tooth, K the sac wall, N the external epithelial layer. The distance between the edge of the enamel and the nest of arteries at the base is readily outlined. The external epithelium at the right has been partially destroyed for want of nourishment, and

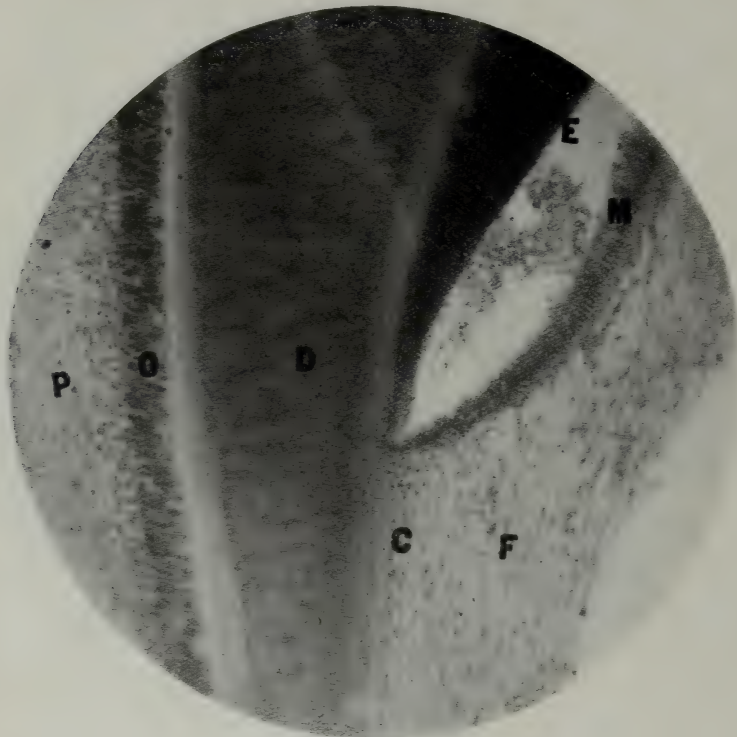
at the right which will eventually encroach on the soft tissues.

Fig. 4 shows the entire development of the root of the tooth: A is the alveolar process, E end of enamel, K wall of sac, N external epithelial layer. The neck of the tooth can be easily outlined at the edge of the enamel. The enamel is completely formed, the dentin still developing. The ends of the external epithelial layer, originally located at the end of the enamel at the neck of the tooth, now are located, as shown in the

other illustrations, at the junction of the papilla and the fibrous tissue of the sac. In this case in the laboratory treatment it has been torn away at the end of the root from the fibrous sac; hence the reason for the two edges not coming together and completing the circle around the dentin. At the upper border outside the external epithelial layer, epithelial

The sac wall eventually becomes the peridental membrane, which develops the cementum. Naturally, if the external epithelium extends below the neck of the tooth, cement substance is deposited on the epithelial layer and not on the dentin. As we have shown, sometimes the epithelial layer stops at the neck of the tooth, sometimes midway along the root,

FIG. 7.



(Magn. 110.)

cells, which I have called "epithelial débris,"* may be seen migrating into the fibrous tissue. It will be noticed that the external epithelial layer is located between the dental papilla and the dental sac, or follicle. As the dental sac adapts itself to the formed dentin, the external epithelial layer is molded to the outer surface of the dentin and the inner surface of the sac.

* Talbot, E. S.: "Interstitial Gingivitis, or So-called Pyorrhea Alveolaris." 1899.

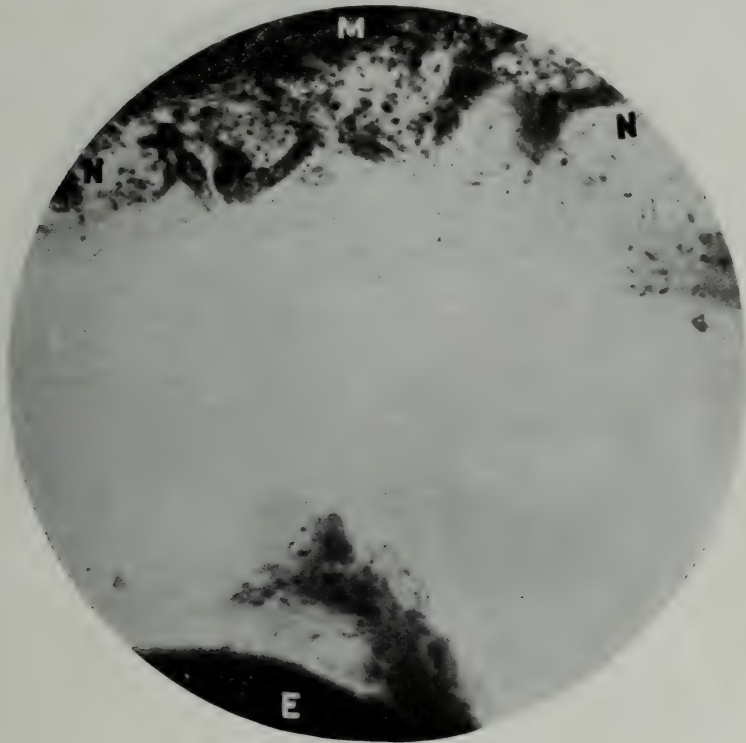
and frequently it extends entirely around the dentin. Sometimes the epithelial cells are destroyed for want of nourishment. Again, not infrequently the epithelial layer does not adapt itself smoothly to the dentin, and loops are formed; in this manner we obtain the granular layer of Tomes to a smaller or larger degree.

In all four of these illustrations the external epithelial layer is well shown. The epithelial cells (dark spots outside the external layer) are readily seen with

the naked eye, but are well defined with a magnifying glass. Please note that the enamel in all of the pictures is fully developed. When the bone tissue is formed, the sac wall, together with the external epithelial layer on the outside, is crowded against the dentin and the enamel. To further demonstrate that the external epithelium is not absorbed

development of the permanent tooth of a dog: A is the alveolar process, c the cementum, d the dentin, f the fibrous tissue after absorption of bone, k the fibrous sac of the permanent tooth, m the external epithelial layer, o osteoclast absorption of root and bone, e the enamel of the permanent tooth. The epithelial cells are readily seen with the naked eye.

FIG. 8.



(Magn. 155.)

before the enamel is formed, the next two pictures are shown. Fig. 5 shows the crown of a permanent tooth and the ends of the absorbed roots of a temporary tooth of a dog: e is the enamel of the permanent tooth, c the cementum of the deciduous tooth, d the dentin, k the fibrous sac of the permanent tooth, m the external epithelial layer, o osteoclast absorption of the root, and p the pulp chamber.

Fig. 6 is also root absorption in the

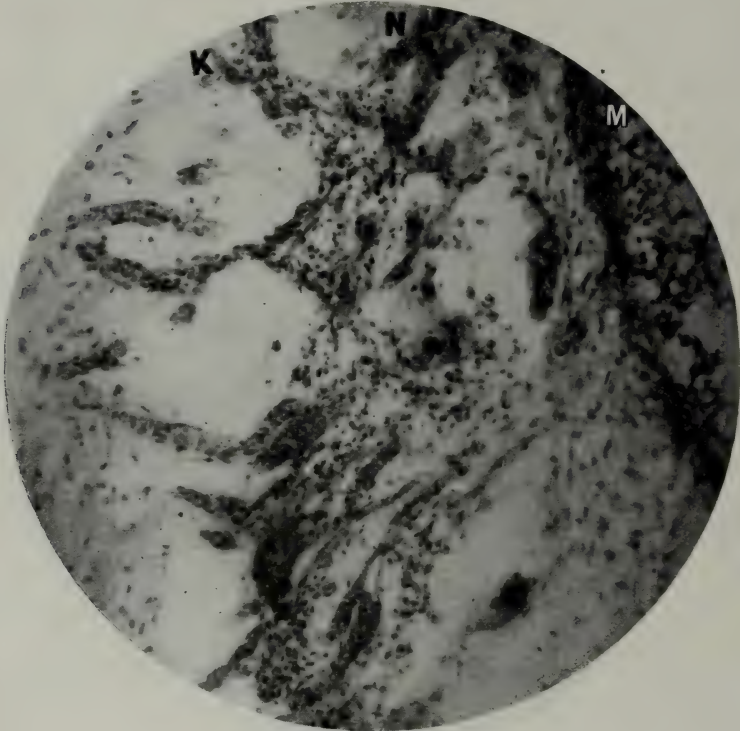
In Fig. 5 the sac wall and the external epithelial layer are in a normal condition; in Fig. 6, owing to pressure against the root of the deciduous tooth, absorption of both external epithelial layer and sac wall are seen. It will be observed, therefore, that the external epithelium and the sac wall may and do remain until the eruption of the tooth.

Fig. 7 shows that portion of the neck of an incisor tooth of a dog: c is the inner surface of the fibrous sac under-

going specialization to form the cementum, *D* the dentin which has formed and outlines the entire outer surface of the root. At this point I wish to say that the cementum does not begin to form until after the periphery of the root is outlined by the dentin, as observed in this picture. At *E* is the enamel fully formed, *F* the fibrous sac,

In the first four pictures the end is located at different points along the root-end and in one instance it covers the entire dentin of the root. My explanation of this difference is that in the development of the enamel organ in some cases there is just enough material to extend around the crown, as seen in Fig. 7. Again, in Figs. 1, 2, 3, and 4

FIG. 9.



(Magn. 155.)

M the external epithelial layer. The cells are easily seen by the naked eye. At *O* is the odontoblastic layer depositing dentin, and *P* the dental pulp. Dead epithelial cells are seen in the space between the enamel and the external epithelial layer. By comparing this picture with the first four it will be noted that the end of the external layer of the enamel organ is in the same position which it occupied before the root began to form and while the enamel was developing from the internal layer.

there is a surplus when the crown of the tooth begins to move toward the surface. If there is just enough material, the external layer, together with the sac wall, is carried with it. On the other hand, when there is a surplus of material the external layer is held down by the sac wall while the root is developing and the crown is progressing toward the surface. The external epithelium seems to obtain its nourishment both from the stellate reticulum and the sac wall. As soon as the enamel is formed and the

stellate reticulum has been exhausted, in some cases the external epithelium begins to disintegrate and the dead cells migrate into space toward the enamel. On the other hand, some of the cells receive nourishment from the sac wall and retain their position and shape until after the eruption of the teeth, in some cases for thirty-seven years, as we

after the enamel has become fully formed and the external epithelial layer has separated itself and become attached to the inner surface of the sac wall. Frequently part or all of the external epithelium does not come in contact and the cells die. Cells that are nourished migrate in single cells or in any number from two to fifty or more. They arrange

FIG. 10.



(Magn. 155.)

shall see later in a paper on the subject of "The Granular Layer of Tomes."

The following pictures are of a higher magnification, taken at different localities from the first four illustrations. The black specks near and around the external epithelium in the first pictures are here enlarged many diameters.

Under a low magnifying power I have already demonstrated epithelial cells in the fibrous sac. These cells migrate into the fibrous tissue of the sac

themselves in strings, in doubles, in loops, and in glandular forms. Naturally a large number are found near and just below the neck of the tooth, for the reason that the external epithelial layer is always found at that locality, while it does not always extend part or all the way around the dentin of the root.

The following illustrations are taken at birth while the dental follicle is still intact and the tooth is just beginning to push its way to the surface. These

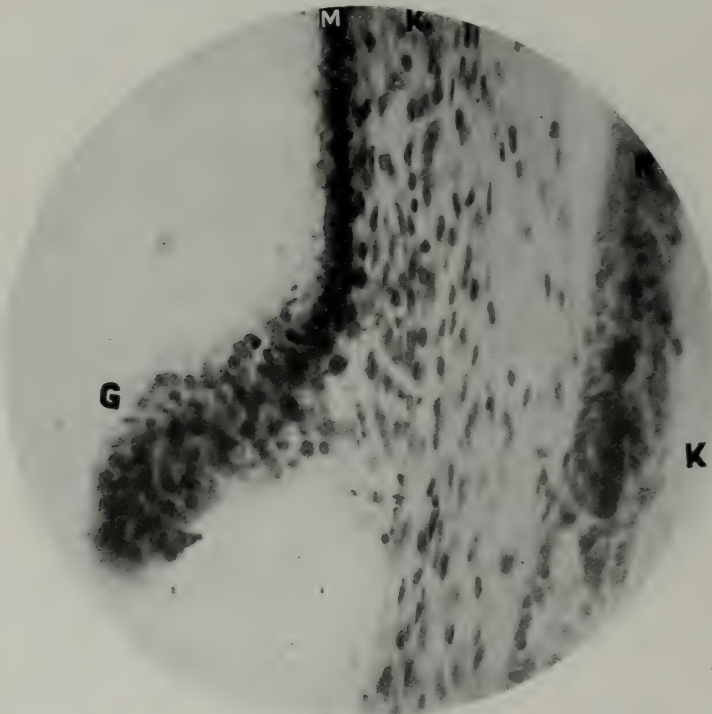
pictures are all of a higher magnification, ranging from 150 to 300 diameters.

Fig. 8 (taken from the upper border of Fig. 2) is one of the most interesting of all. It is located at the upper border of the sac and in the direct line of the advancing tooth. It shows the cutting edge of a human incisor with a space between it and the external epithelium:

fibrous tissue, instead of outside, as is usually the case.

Fig. 9 (taken from the left of the crown of Fig. 3) shows the epithelial layer disintegrating at the right of the illustration; quantities of epithelial cells have migrated from the layer into the fibrous wall of the sac in the center: κ is the fibrous sac, μ the remains of the

FIG. 11.



(Magn. 400.)

E is the enamel at the cutting edge of the tooth, μ the external epithelial layer, ν epithelial debris. Dead cells are seen on the surface of the enamel. The external epithelial layer is seen at the edge of this illustration. At the right, but not visible in the picture, is a break in the epithelial layer, and the fibrous sac has penetrated inside the layer. The fibrous tissue is observed below and in the space. The epithelial cells or debris have migrated inside because of the

external epithelium, ν epithelial debris. This picture is taken at the left of the crown of an incisor tooth at birth.

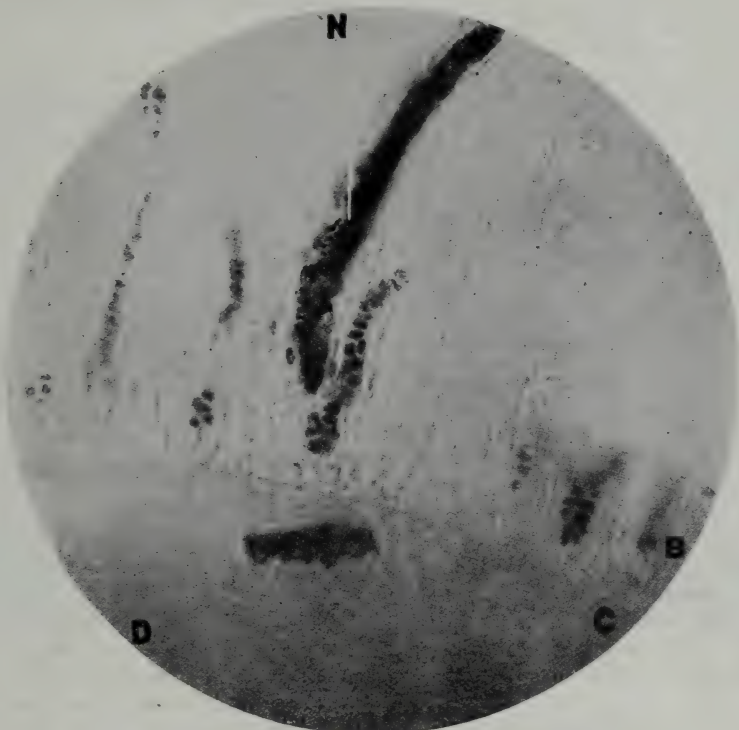
Fig. 10 is taken at the right of a human cuspid crown, Fig. 3. Dead epithelial cells are seen on the enamel. The external epithelium is disintegrating. The live and dead cells are readily seen. Epithelial cells are seen at the left migrating into the fibrous structure.

Fig. 11 shows the end of the epithelial layer taken from Fig. 2: G shows the

granular or dead cells at the end of the disintegrating external epithelial layer, *K* the fibrous sac, *M* the epithelial layer, *N* epithelial débris. The layer is in close contact with the fibrous sac for the entire distance, except at the end. Cells are migrating into the fibrous sac at the right. At the end, where the cells are not nourished, death is rapidly taking place.

Up to this period—that is, while the external epithelial layer is disintegrating—the dental sac is isolated from the surrounding tissues by a space. The fibrous tissue of the alveolar process now begins to develop toward the sac and the space is closed, thus uniting the sac with the fibrous tissue of the alveolar process. Bone development now rapidly occurs,

FIG. 12.



(Magn. 300.)

Fig. 12 is taken from a sheep, and was shown in "Interstitial Gingivitis," published in 1899. Here *B* is the peridental membrane, *C* the cementum, *D* dentin, *N* epithelial débris. Epithelial débris is also seen embedded in the cementum. It shows the cells in rows, in glandular groups, and in different shapes. The most interesting thing of all in this picture is the group of epithelial cells caught and embedded in the cementum. The wonder is that they are not more numerous.

filling the fibrous tissue and encroaching on the fibrous sac. After the fibrous tissue of the alveolar process has united with the sac wall, the vascular supply has become established between the alveolar process and the sac, which has now become the peridental membrane, and for the first time cement begins to deposit on the dentin—or on the external epithelial layer if it extends below the neck of the tooth.

The epithelial débris of Robin and Magitot and that described by myself are

quite distinct in their origin and in their environment. The epithelial débris of Robin and Magitot is derived from the epithelial cord outside of the dental follicle, and the cells migrate into the fibrous tissue which eventually becomes the alveolar process. The fibrous tissue in the alveolar process does not approach the sac wall until after the enamel has fully formed and the dentin has developed upon the periphery of the dentin bulb.

The epithelial débris which I have described is derived from the external epithelium inclosed within the follicular

wall. The live cells of the external epithelial layer migrate into the inner fibrous tissue of the sac but do not pass through into the alveolar process. The fibers of the alveolar process now unite with those of the outer surface of the sac, which later becomes filled with calcium salts to form the alveolar process. The alveolar process now encroaches upon the sac wall, which becomes the periodontal membrane, holding the epithelial débris within its fibers.

31 N. STATE ST.

(To be continued.)

Oral Surgical Cases in Practice.

By S. L. SILVERMAN, D.D.S., Atlanta, Ga.

PROFESSOR OF ANESTHESIA AND ASSOCIATE PROFESSOR OF ORAL SURGERY, ATLANTA-SOUTHERN DENTAL COLLEGE.

(Presented before the Missouri State Dental Association, St. Louis, April 14, 1919.)

IN the choice of cases to be reported under the above caption it is the essayist's paramount wish to present some few cases treated in a manner which, though often criticized and generally held in disfavor, yet is one that, where indicated, yields most gratifying results.

The first case to be presented (Fig. 1) is that of an impacted lower third molar lying directly under the second molar. And while the manner of correction here is not open to criticism, still my maxim that all impacted teeth should be removed, whether or not obvious causative factors in local or constitutional disturbances, is, I am aware, not concurred in by the majority of the profession. In view of Upson's observations as to the ill effects of impacted teeth upon the nervous system, oftentimes resulting in obscure pains of reflex nature, in insomnia, and even in insanity—especially that form of mental aberration known as de-

mentia præcox—it would seem that the disapprobation of the rule calling for the removal of all impacted teeth should, to say the least, be diminished.

That an impacted tooth is producing no local disturbances today is by no means an indication that it will not assert itself at some later time detrimentally to its host. Aside from the innumerable constitutional ill effects produced by impactions, they are always a menace to the field in which they lie; and though an impacted tooth may remain for years dormant in its seat, one can never tell when the resistance of the circumjacent tissues will be overcome by this insidious force, and result in some local lesion that too often (especially in the aged) is mistaken for malignancy. Unfortunately I have seen these cases after prolonged suffering undergo operations for supposed malignancy with the usual sequelæ of deformity and discomfort.

To return to our case: Fig. 1 presents conditions in a man of forty-two, having been for the preceding few years in a wretchedly nervous state, but having lived to this age without any local manifestations. Suddenly a slight swelling appeared, with considerable trismus and pain as concomitants, the condition culminating with a discharge of pus at the cervix of the distal surface of the second molar. The second molar having been undermined by the destructive pro-

cess at this time to emphasize that the dogmatic adoption of certain techniques without utilizing other methods that may be expedient and meritorious destroys versatility, and that this narrowing of oneself reflects on both patient and operator.

That splints and modification of the Gilmer method of wiring are the best means of reducing and correcting fractures of the jaws no one will deny, but in edentulous or semi-edentulous jaws

FIG. 1.

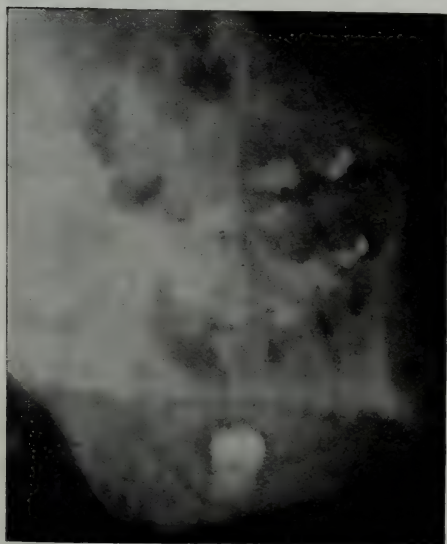
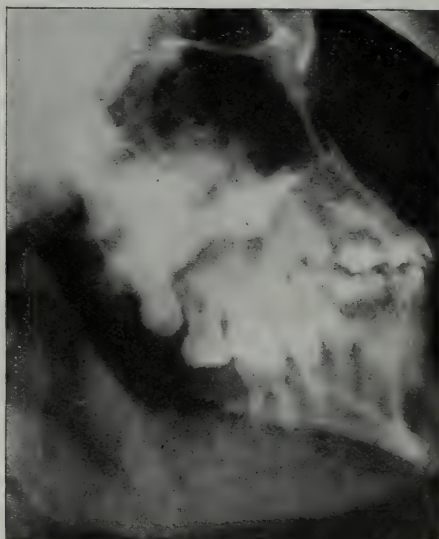


FIG. 2.



cess was removed, along with the third, the operation being done intra-orally. The patient made an uneventful recovery, both as to local and general symptoms. Fig. 2 shows the case several months after the operation, with osseous reconstruction to a degree that insures more strength at this point of the mandible than it would have had even had the third molar remained in a healthy state.

Fig. 3 shows a case of single hare-lip (patient partially anesthetized) that was treated with an Owen operation, where only a single flap is used, and though subjected to criticism secured the results that followed a carefully planned procedure. (See Fig. 4.) I reproduce these

anything less than actual wiring of the bone itself is a compromise with what should properly be done. And yet one may hear almost a universal and incidentally a just declinal against the use of this method. But, as in many uncompromising positions, the failure to actually wire the fractured bone with virgin silver wire results in wiring artificial dentures together, or other ineffectual appliances incapable of immobilizing the parts, and consequently failure ensues in the form of non-union and marked deformity. Fig. 5 shows a fracture coming under the above description in a negro forty-seven years of age. The patient having, in my opinion, an insufficient number of occluding teeth suitable

FIG. 3.



FIG. 4.



for the application of an intra-oral appliance, an incision was made along the lower border of the mandible, the bone bared, and the wire inserted through the

wire be felt by palpating lingually and buccally.

A singular and rather puzzling feature to be noticed in the case, as shown in

FIG. 5.



FIG. 6.



two holes, made sufficiently distant from the line of fracture to insure healing. Fig. 6 shows the same case radiographed exactly two years after the operation, and the result here is too obvious for descriptive comment. The patient is totally unconscious of having any foreign object in his jaw, nor can any callus or

Fig. 6, is that although the jaw is in perfect condition the wire has broken into three pieces.

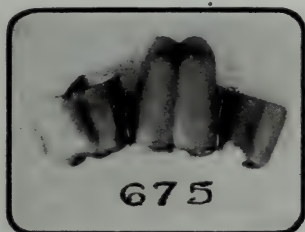
FOURTH NATIONAL BANK BLDG.

Gold Three-tooth Molar Bridge Removed from the Right Bronchus: Case Report.

By CHEVALIER JACKSON, M.D., F.A.C.S., and WM. H. SPENCER, M.D.,
Philadelphia, Pa.

MAN, aged forty-four years (case No. Fbdy 675), was referred with the history that four days previously, while in the dental chair having a gold and porcelain three-tooth bridge fitted, the denture (see Fig. 1) accidentally dropped on the tongue and disappeared down the throat. A paroxysm of coughing immediately followed and the patient

FIG. 1.



Bridge removed from right bronchus by peroral bronchoscopy.

had a momentary sensation of a foreign body in the pharynx. It was assumed that the denture had been swallowed, and the patient went home with the advice to take physic. This he did for two days, but failed to recover the object in the stools.

On the evening of the accident there had occurred an attack of spasmodic dyspnea, attended by an unproductive, annoying cough, and by an asthma-like wheeze which was distinctly noted by the patient and his friends. The attack of dyspnea lasted about half an hour, but recurred at frequent intervals, the wheezing continued, and the annoying cough persisted. It was noted that the cough and spasmodic dyspnea were ag-

gravated when the patient was on his right side or back. There was a temperature elevation varying between 99° and 100°F. The patient at no time complained of pain, and felt in his usual health, with the exception of being greatly concerned about the presence of the foreign body.

By physical examination the foreign body was localized in the right main bronchus, and the physical findings were confirmed by radiographic study. (See Fig. 2.)

In Jefferson Hospital, the bridge was removed from the right main bronchus by bronchoscopy through the mouth, after local anesthesia, in 31 seconds. The endoscopic findings showed localized bronchitis at the site of the foreign body, with considerable pus oozing up from below.

No reaction followed the bronchoscopy. The asthmatoïd wheeze disappeared immediately on the removal of the foreign body, and all signs of dyspnea ceased. The temperature, pulse, and respirations were normal on the second day after the operation and the patient was discharged in the state of health existing before the accident.

COMMENTS.

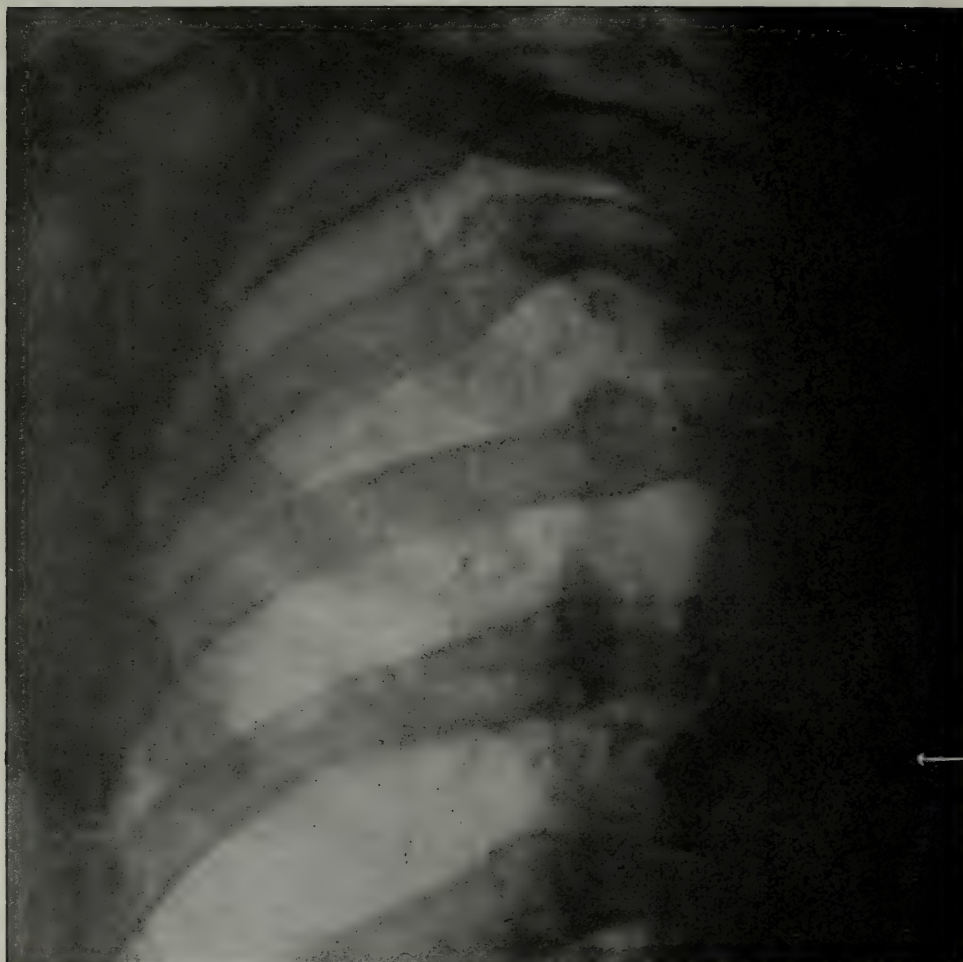
(1) The wheezing described in the history was a typical example of a new sign of foreign body in the bronchus—the “asthmatoïd wheeze” recently described by Chevalier Jackson.* The sign

* “A New Diagnostic Sign of Foreign Body in Trachea or Bronchi—the ‘Asthmatoid Wheeze.’” *Amer. Journ. Med. Sciences*, November 1918, No. 5, vol. clvi, p. 625.

is elicited by placing the ear in front of the patient's open mouth and requesting a forced expiration. The wheeze has many of the characteristics of asthma, but is of a dryer quality, and is best

lumen may be increased by spasm. The diagnostic import of the asthmatoïd wheeze, when present, is very great, especially in cases of suspected foreign body in the bronchus in which the object is

FIG. 2.



Radiograph showing three-tooth bridge in right main bronchus.

heard after the air-passages have been coughed clear of secretions. The sound is probably produced by the passage of air through the narrowed bronchial lumen at the site of the foreign body. Possibly the narrowing of the bronchial

not opaque to the roentgen ray. That the wheezing was due to the presence of the foreign body is proved by the history of its inception at the time of the aspiration, its continuance during the sojourn, and its immediate disappear-

ance after the removal of the foreign body. The spasmodic dyspnea, or asthma-like attacks, are explained by spasm of the bronchial musculature due to the irritation incident to a shifting of the foreign body, and in part to the accumulation of secretion in the bronchi below the level of the foreign body.

(2) Mention should be made of the practice of administering physic for the purpose of aiding the passage of a supposed foreign body in the alimentary tract. It is our custom in such cases to rigidly avoid catharsis, and in no way to change the patient's ordinary diet. Should the foreign body be pointed or have sharp edges, the stimulation of peristalsis and the liquefaction of the feces by cathartics render more liable a perforation of the intestine. The intestinal walls are better protected when the foreign body is surrounded by intestinal contents of normal consistence. A change in the usual diet of the patient may have a similar disturbing effect on the gastro-intestinal function, this

being particularly true with young children.

(3) We must again emphasize the importance of radiographic study of the lower respiratory and the alimentary tract for the purpose of localizing a foreign body which has been "swallowed."

(4) The prompt recovery of the patient can be directly credited to the early recognition of the possibility of the foreign body having been aspirated instead of swallowed. Had the foreign body been allowed to remain for a longer period, abscess of the lung would undoubtedly have developed from the almost completely obstructed drainage of that portion of the lung distal to the foreign body.

(5) While the aspiration of a dental object is a very rare accident, considering the millions of times dental work is done, yet it might be well always to have the possibility of such an accident in mind while working in the patient's mouth.

1830 SOUTH RITTENHOUSE SQUARE.

Report of the Committee on Practice—Dental Society of the State of New York.

By PAUL R. STILLMAN, D.D.S., New York, N. Y.

CHAIRMAN OF THE COMMITTEE.

(Presented to the Dental Society of the State of New York, at its annual meeting, Syracuse, June 13, 1919.)

THE year just closed is recorded as the fifty-first year since the founding of this society. It has been the most momentous year since the world entered upon the Christian era. Our country is again at peace, and the reconstruction period which follows all great upheavals of the social order has now set in. Our social and economic traditions are rapidly undergoing a developmental change. When sufficient time has

elapsed to cover this period of reconstruction, and the spirit of mankind has again quieted down and is able to enjoy the blessings of peace, we shall be able to review this period in the retrospect and really grasp the changes which have taken place. It will be found that the profession of dentistry no longer is what it has been held to be, not only by many of its members, but by the people in general.

The dental world has been no less in a ferment these past five years than the political world. Our professional outlook upon practice and our allied sciences is as different now from what it was in 1914 as is the world's attitude upon most social and economic problems. The calm, smug, self-satisfied individual has no place in the present-day world; problems press for settlement—especially the problem of focal infections in relation to the teeth—and every dentist who possesses professional life is deeply concerned in the settling of them.

THE DENTIST IN THE SERVICE.

The mobilization of the medical and dental professions as a collateral department of the service under the command of the Surgeon-general of the army was a war necessity. The wisdom of including dentistry in the medical branch has been clearly proven by the results, which redound to the credit of both professions. For the first time in its history has the dental surgeon been given equal rank and equal opportunity with the medical surgeon. With the organization of the dental corps as a component of the medical department our profession was gratified; it felt that recognition had been given by the Government, by the medical profession, and by the people. The daily close personal intercourse of the two professions in the army has resulted in a mutual respect and esteem. The medical profession has had the opportunity to observe dentistry, and as a result to appreciate it, while the dental profession has by contact learned much which is greatly needed, and more potently to admire. It should not be lost to sight, however, by those of us who have doffed the olive drab and resumed the office coat of civil life, that we are still dentists; that our relations with the medical profession, though undeniably closer, leave our professional status quite unchanged. The fusing of the two professions into one department of the army did not make physicians of the dentists, however much of medical learning they absorbed by study and the ex-

perience of contact. Dentistry is a profession in itself, with a history quite separate from that of medicine. It is so ordered by statute. It must be as dentists that we will develop in our education and our science. It seems right and just that we develop along the lines of self-determination, and that our autonomy and honorable traditions be jealously guarded from every outside group who may seek to meddle or to dominate.

The manner in which Dentistry has met the demands which service in the great war thrust upon her; the enormity of the work which was accomplished by the civilian organization, the Preparedness League of American Dentists; the courage with which the whole profession carried on its line of duty; the personal sacrifices which many of her members made, and the tremendous service which she rendered in the name of patriotism, redound to her everlasting credit.

ORAL SURGERY.

Those of us who have had the pleasure of reviewing the work of the oral surgeons who have served in the hospitals of France, of England, and here at home, the wonderful and amazingly successful surgery of the jaws and face, have only had a glimpse at the picture of war surgery as it pertains to dentistry. The spot-light of our attention will be directed on this subject during the next few years, as the data is prepared and released for publication, and the result will be a new professional pride in this still immature specialty which is a part of dentistry. Oral surgery had never been definitely demarcated up to the time of the outbreak of the war, even by its leaders. It has now established its place in the sun and convinced the most skeptical of its right to a definite field of work. As appreciation of the part which was played by the oral surgeon slowly filters through, one can only marvel at the opportunities for its development and the enlargement of its scope.

Probably no one achievement of dentistry has served to so close up the

medico-dental breach, and to win mutual admiration and respect, as has the work of the oral surgeon—the dento-medical war surgeon.

THE NEW ORDER.

There is a new order in the dental profession which has begun to shape its activities in an ever-increasing interest both within and without the profession. The Oral Hygiene propaganda which began some fifteen or twenty years ago with very small beginnings and few workers, has begun to assume (like the prohibition propaganda, the blessings of which we are about to experience) a very formidable influence upon dental practice. These so-called fanatics, the oral hygiene group of dentists, for years have been staying up nights, going out to lecture at one public school or another, to this settlement house, or that mothers' club, to a block party—anywhere, the same as any ordinary social crank; preaching the gospel that "A clean tooth never decays." It is a well-appreciated fact among the oral hygiene propagandists that a school child becomes adult in fifteen years. As adults, the children who have been taught and lectured that they should care for their teeth and for the health of the mouth generally, are now, many of them parents of a school child or two themselves. The result is that the public is at this time demanding service of the dentist which conforms with the facts which were taught by the pioneer lectures in oral hygiene. They are searching for dentists who will "clean their teeth" and "treat the infections of the gums."

Much of this unrest can be blamed to the oral hygiene campaign. It would seem that there are but two ways of relief; either dentistry must suppress the oral hygiene propaganda or change its practice to conform more nearly with the modern demands of the public.

To those members of this society who are not interested in the prevention of periodontal infection and of dental caries; to those who are not making practical application of the knowledge of oral prophylaxis which is already at hand

and available, we say that the day is coming when if you neglect to inform a patient of the necessity for this treatment you will be held guilty of professional negligence, as well as liable for damages in some court of law. It is surely as great a breach of professional duty to assure a patient that he is in a condition of dental health when there is an evident progressive periodontoclasia present in his mouth, as it would be for a gynecologist to ignore the presence of a retained placenta—and some so-called gynecologists have been sent to jail for that.

DIAGNOSIS OF FOCAL INFECTIONS.

It is not the dentist alone who has become interested in the physical disorders which arise from an unclean mouth. The family physician has learned that there are deeper infections dependent upon the health of the apical tissues about the teeth. He, lacking both the knowledge and the facilities for making "dental diagnosis," and having received at frequent intervals the advertising literature of some so-called "X-ray laboratory," together with some specimen radiographs, refers cases which are suspected of having some focal infection to one of these roentgen manufacturing companies or the like, not knowing that these establishments are in the same class with the other advertising quacks in both medicine and dentistry. These self-styled laboratories are often presided over by some dabbler in electricity, some layman oftentimes, who has no medical or dental education whatsoever. Radiographs from these establishments are frequently mailed to or delivered into the hands of the patient, with small ink arrow-markings to indicate the location of the trouble, like the yellow journal illustration with its arrow indicating "This is where the body was found," designating and diagnosing such afflictions as necrosis, granuloma, pyorrhea alveolaris, etc., for the edification of the physician and the increasing alarm of the patient. The indignation of some of these poor scared, misused people at some dentist—no, not at the

physician or the radiographer, but indignation at the dentist who has served them to the best of his ability, is occasionally quite passionate. It is difficult to pacify some who fall into the hands of other dentists for consultation, for they want a healthy mouth so badly that they are ready to fight for it.

The average dentist is quite competent to interpret dental radiographs. Diagnosis in every case of periapical infection should not exclude the consideration of the clinical facts as they appear not alone in the radiograph, but in the patient himself. Experience has taught many who are called upon to offer diagnosis from radiographic evidence alone that such evidence is quite misleading, and that a condition quite the reverse to the one which would naturally be expected is found upon close examination of the patient. Correct diagnosis should be based upon the relative importance of all the clinical facts.

THE ORAL HYGIENIST.

We have within the confines of the state two institutions which before ten years have elapsed will have made their existence felt in the prevention of oral disease—the school of Oral Hygiene of Columbia University in New York City, and that of the Eastman Institute of Rochester, New York. In these institutions oral hygienists, or so-called dental nurses, are being trained as teachers and conservators of dental health and are under the protection of the dental profession. In comparison with the medical nurse they have a far broader opportunity and a far more cheerful environment in which to labor. This new profession is attracting the best type of young women. It is only those dentists with an inherent reactionary type of mind who do not feel that the oral hygienist is an auxiliary to dental practice who will be of infinite mutual benefit to the public, to the dentist who employs her, and to herself.

The oral hygienist's duties are to keep the healthy mouths of a dental practice in a continuing state of health; to antici-

pate caries of the teeth, and, should such a calamity occur in the mouth of a patient, to promptly report the fact to the dentist. They teach the personal care of the teeth, establishing habits of the mouth toilet which are in themselves prophylactic. The influence which these women will soon wield upon the children as well as upon the parents of the children in regard to the relation of a healthy mouth to a healthy body will be alarming to some dentists who propose to ignore them. The demand for their services will be so great, when their beneficial influence upon health conditions begins to be understood by the public, that they will fall into the class of family necessities and will not in any sense be regarded as a luxury.

PROPHYLAXIS.

It may have been forgotten by some that the familiar word "prophylaxis" is derived from the pure Greek root *προφυλάσσω*, which means literally "an advance guard." In these post-bellum days, these anxious days of reconstruction of the social balance, is it not an honor to be known as one of the company of the Advance Guard, whose shibboleth is "Oral prophylaxis," and upon whose shield are the words "Preventive dentistry"?

Prophylaxis is the most potent word in dental or medical nomenclature. To be one of the advance guard in the science of preventing localized mouth infections, would be ideal from the dental aspect alone. To control and prevent caries, and the development of necrotic, septic pulps; to control and prevent so-called "pyorrhea"—all this is not only being practiced but accomplished with success. It is a service which is appreciated by the patient, and one which is paid for at the same if not a better fee rate than that which is paid to another dentist for any other service. Patients desire such service. They even leave the practice of the one who neglects to do this class of work; they distrust and malign him as an incompetent dentist.

But all this is looking through the big

end of our binocular. There is a far greater, broader aspect to oral prophylaxis than the satisfaction of knowing that one's dental service has been correctly rendered and appreciated and the fee promptly paid. Let us turn the glass around. It is the influence upon every other infection within the body organism which makes the possibilities in the oral prophylaxis field almost stagger one's mental poise.

How great a factor the presence of infection of the teeth really is in metastatic disease we have as yet been unable to evaluate. The list of counts in the indictment is a very long one, and the special grand jury of Research is in continuous session and is increasing in number almost daily. At first we thought it was a fad that would spend its force with its own inertia, but the ever-increasing volume of investigation continues to bring to light fresh evidence of diseases with a dental origin. Many of these were until recently of hitherto obscure etiology. In view of the evidence that has been so amply confirmed by the studies and observations of many, very many, of the scientists in research both medical and dental, do the changes which are expected in dentistry seem ephemeral? Is not the real progress in dentistry, then, to be brought about when we each and every one of us get down to real work upon the control of disease? To you, brother, who are floundering about in an office whose waiting-room is overcrowded: Rent an extra room or two, and employ a couple of bright young just-graduates. They will know how to fill root-canals as well as you; they will relieve you of much fatigue; they will be a source of income, too. Your remaining years of service are along a broader, smoother highway. Get acquainted with the fundamentals of prophylaxis, and you will soon believe that every other kind of work in a dental practice is a specialty of periodontia. Let loose your penchant for repairs to diseased teeth, and restorations, and take up your duty to humanity by preventing the necessity for the type of work in

which you are engrossed; preach oral health, and practice what you preach. Join the advance guard!

There is so much evidence which points to the tremendous possibilities along this line of work. This, for example: A certain New York dentist, who desires that his name be not incorporated in this report, has an oral prophylaxis practice of twenty-eight patients. They come monthly. The appointments for the year of these cases showed an attendance average of more than eleven visits each. These people all have healthy mouths. An investigation was made of these cases in order to check up how many or what percentage had been attacked in the influenza epidemic. Not a single one of the whole twenty-eight patients had a touch of influenza, although there had been, in one instance, six cases in the immediate family and under the same roof, one of which resulted in death. No one who is doing this work—not one—will deny that he frequently hears his patients tell of how much better their health has been since this work has been regularly done. They will also tell you how many pounds in weight they have gained. They will say, "Do you realize, doctor, that it has been six years since I have had a cavity come in any of my teeth? I wonder if my teeth would be as sensitive to the drill as they used to be?" Just think that over!

Just a word of caution, however. Do not undertake to beautifully polish the enamel of a tooth which the radiograph may reveal to be in very truth a whited sepulchre housing a dangerous infection, nor depend on the stimulation of the orange-wood point to counterbalance the irritation of an uncorrected traumatic occlusion. The practice of oral prophylaxis must be built on sound foundations, and cases must receive the benefit of thoughtful diagnosis. The mere routine treatment based upon the motto "Treat every one alike" will bring disappointment and failure in this, as it does in medicine. Unlike many other problems in dentistry, oral prophylaxis depends

upon a biologic reaction. In oral prophylaxis we do not "make," we "treat."

ORTHODONTIA AND ORAL PROPHYLAXIS.

What constitutes the practice of oral prophylaxis? Fundamentally comes the being able to recognize the premonitory symptoms of dental disease, the incipient lesions which precede the actually pathologic, and to so treat them that they will resume the physiologic. The premonitory symptoms which precede the development of a child into a dental cripple demand an academic knowledge at least of the scope and possibilities of orthodontic practice. It is the dental cripple with his incongruous and inefficient malocclusion who develops into the dental defective. This type of cripple has a far more potent influence upon the health of society than has as yet been realized. There is scarcely one who reaches the age of thirty years but carries some evidence of oral sepsis. By far the largest percentage of humanity are living in spite of their infirmity of reduced function the result of malocclusion. It is by function that life itself is sustained and nutrition accomplished. Thus we may say that to have normal function of the teeth from the physiologist's point of view, we must also have the dentures in harmonious and efficient occlusion.

By far the large majority of children have pronounced malocclusion of the teeth, and so we give the orthodontist the first place in oral prophylaxis. Can the orthodontists accomplish one-thousandth part of the work which lies waiting for their hands to do? At least, they do not. Twenty-five hundred additional orthodontists could not do all the work that is needed in orthodontia in this state alone. One wonders at the orthodontist in his office engrossed with the problems of his daily practice when the world is suffering for need of his service as a teacher of other men. Where is our "orthodontic hospital," with its free clinic for the poor school child? We wonder at the broad lack of interest in this necessary and essential specialty of dentistry.

MANAGEMENT OF CASES IN PRACTICE.

The whole field of oral prophylaxis hinges primarily on the eradication of irritation of the investing structures for the prevention of periodontoclasia, and the anticipation of caries of the enamel by thorough sanitation. The treatment for the prevention of caries in occlusal sulci is best carried out by drying and cleaning and filling the depth of the sulci with one of the copper cements. Sanitation of the mouth may be accomplished by keeping the teeth clean. This is not always possible for the patient to do unaided, and the cleaning and polishing operation which has come to be known as a prophylactic treatment should be regularly given until the mouth health indicates that longer intervals may be allowed to elapse between treatments. Your committee in the report desires to avoid the appearance of re-serving the ceremonious Thanksgiving-day turkey in the traditional following-Saturday-dinner manner. Much has been said and written upon prophylaxis treatment for caries; much more will have to be said and written, doubtless, before the dental profession is of one mind as to the importance and practicability of its application.

The subject of oral prophylaxis may be divided for the benefit of study or presentation, but when it comes to the service to the patient the necessity of each case leaves no place for a divided application of its principles. Every known thing or method the results of whose use will make for the health and preservation of the teeth should be resorted to as the necessities of each case demand.

It is very widely held both by dentists who practice oral hygiene and by the oral hygienists as well, that the whole problem in oral hygiene rests when the surface of the enamel has been polished. It is quite true that given a case having normal occlusion and clean teeth, and no irritation to the investing structures, a mouth may probably be kept in a condition of health—both health of the dental tissue itself, and health of its

vascular investment. This is not true, however, when there is an inco-ordination of the occlusal relation of the teeth. Irritation from this source is the most subtle as well as the most destructive factor in the etiology of oral disease. One cannot overlook and ignore traumatic occlusion. Not only must the mouth be kept in a state of sanitation, detritus and débris thus being suppressed, but also the irritation caused by traumatic occlusion must be controlled so that the deposits may not accumulate.

CORRECTING TRAUMATIC OCCLUSION.

For those to whom the term traumatic occlusion means no more than does the term nebular hypothesis it may be explained here that the human body is a mechanism exactly as is an automobile or an engine. The teeth and the mandible, which is the moving part of the dental mechanism, may be here compared to the moving parts of any mechanical apparatus—an engine, for instance. Every mechanic, engineer, or mechanical engineer knows, and it seems doubtful if every dentist does not know, that every part of any mechanical apparatus must co-ordinate. In other words, the several parts must work in harmony when they are set into motion or function. An automobile owner knows that a loose wrest-pin or a worn main bearing means a mechanical vibration which will soon bring the machine to the verge of ruin if it is allowed to go uncorrected.

Traumatic occlusion of the teeth is in principle identical with such a condition in an automobile. The occlusal planes of the teeth, through many causes which it would be improper to enumerate or discuss in this report, become mechanically out of harmony with the opposing teeth. This results in a thrust, a jar, a knock, which in traumatic occlusion is transmitted to the investing structures, first as an irritation and later as a positive injury and factor in the cause of disease. Traumatic occlusion may be diagnosed in its very early stages. Its symptoms are manifested by both atrophy and hypertrophy of the gingiva, which develop according to the resistance of the

organism to its influence; it is manifested by symptoms of thermal shock simulating both a pulpitis and a necrotic pulp, inasmuch as either heat or cold or both may cause the thermal reaction; it is manifested by mobility of the teeth when the teeth are closed together and in contact; it is manifested in many other ways by reflected symptoms to the gingiva, and in each and every instance it is a potential factor in the etiology of both caries and dental periclasia, with subsequent symptoms of pocket formation and pus flow which is correctly termed "*pyorrhœa alveolaris*," if one still enjoys using that term.

The subject of oral prophylaxis is quite incomplete, and the treatment in this and in oral hygiene will be quite inefficient, if this important phase of dental practice is ignored in treatment.

It has taken dentistry the greater part of fifty years to reach the state in which we believe she is found today, namely, with potential ability to control a vast percentage of disease. This change is one which is not observed among ourselves alone. The eyes of every student of medicine and its allied sciences are directed toward dentistry, watching and wondering if she will rise to her duty in answer to the well-known query of the celebrated Dr. Mayo. Medical men are eager for this development. Dentistry has aroused their interest, for scarcely a medical journal appears without some article on the subject of oral infections. The medical man has a far keener realization and insight into the future than the dentist. He has already asked himself, "What if it should develop that the supreme control and prevention of disease should lie outside of my own field and within the exclusive field of dentistry?"

This profession of ours offers to the student and the practitioner alike a vast domain, redolent with its possibilities of new discoveries, and a fruitful field for service to mankind. The field of prophylaxis offers greater opportunities than any other for the accomplishment of deeds within the scope of our profession. It must, however, be an organized, co-ordinated professional body; iso-

lated devotees to this idea will not satisfy even the demands of the moment. We must transform our habit of professional thought. The dental artizan had the mind of the artizan—a mind set upon making something with his hands, a mind set upon producing some appliance, or repairing some carious tooth. Such thinking reaches only as far as from the laboratory bench to the operating chair. What we should do is to take upon ourselves the habit of thought of the more advanced medical man whose mind is set upon the prevention and control of disease. The recent pronounced activity of the dental mind, which for the moment seems to concentrate upon the pathologic in the matter of root-canal technique, is but a step away from the artizan. Surely we must justify ourselves in the matter of periapical infection by correcting our errors and mistakes. That is restitution, but, to do justice to our people, we should never allow the occasion of root-canal work to occur as a necessity in practice.

Dentistry has proven the truth and the possibilities of oral prophylaxis. She has taken a step out of the past and has entered into a new era. Let us hold the ground which we have won, so that the honor and the work already done may be inherited by our brothers and sons who will carry on our high calling in the years to come. Let us continue confidently to believe that we labor in a field rich in prospects for development—a field where service of the greatest importance to the physical welfare of mankind may yet be rendered. Let us bestow good will and co-operation upon every other branch of the healing art; recognize the dignity of our own calling; realize that the mouth is both the door of health and the procreator of disease, and be confident of a future greatness for our profession that our imagination or dreams have never heretofore conjured.

52 VANDERBILT AVE.

[See also *Discussion*, as reported under "Proceedings of Societies," this issue.]

What Constitutes Reinfection of Root-canals, and How Can It be Prevented?

By HERMANN PRINZ, A.M., D.D.S., M.D., Philadelphia, Pa.

(Read before the annual meeting of the Dental Society of the State of New York, Syracuse, June 14, 1919.)

IF a primarily infected root-canal which has been properly treated and thereby rendered sterile upon its surface by approved methods is sealed with cement and with an antiseptic dressing left *in situ* for some weeks, it will be found that at a subsequent bacteriologic examination the canal again is infected with precisely the same organisms which caused the original infection. These reinfections apparently occur in chronologic sequence.

Mayrhofer has shown that at the end of the first week after complete surface sterilization about 75 per cent. of the treated canals proved to be sterile; at the end of the second week about half, and at the end of the eighth week only 10 per cent. remained sterile. The nature of the antiseptic employed, in this particular instance formocresol, seems to make very little difference, although we have observed that electro-sterilization and dichloramin-T slightly lengthen

the period of temporary sterility. However, one important fact stands out pre-eminently: *An incipiently infected root-canal cannot be sterilized permanently by the antiseptic methods of treatment now in vogue.* To completely sterilize an infected tooth root—basing our conception upon our present knowledge of antiseptic action—implies removal of the tooth bodily and thoroughly boiling it.

Irrespective of this absolutely established fact, dental literature is still pregnant with such statements as: "Cresol-formalin will have sterilized the entire tubular structure of dentin, thus establishing asepsis." As no bacteriologic proof is furnished, such empiric statements are misleading. As a matter of fact, infectious material may be obtained at any time from a so-called sterilized tooth root, and when placed in a nutrient material will almost always show a luxuriant growth of pathogenic micro-organisms. Complete sterilization of any object can only be attained by the harmonious co-operation of three important factors: Absolute contact; time during which this contact is maintained, and sufficient concentration of the antiseptic employed. A break in the circuit always indicates failure. The complicated system of dentinal tubuli which traverses the entire area of dentin offers hiding-places to the infective organisms, and as the interior of the dentinal tubuli cannot be reached by surface application of the antiseptic on account of insufficient contact, the attempted destruction of these deep-seated infections will always be a failure. These very conceptions were clearly set forth by the late W. D. Miller as early as 1890, when he stated: "We must, in the first place, reconcile ourselves to the fact that a complete sterilization of a suspected tooth with the conservation of the periosteum is absolutely out of the question."

The most momentous question arises at once: How does this reinfection occur? Four possible modes suggest themselves. The reinfection may start by gaining entrance into the filled canal from the pulp chamber; it may occur via the circulation; it may pass along the peri-

cementum from the gingival margin, or it may take place from organisms left in the canal or in the dentinal tubuli. The first route is rather difficult to imagine, especially when the root-canal filling, which is naturally more perfect near the pulp chamber, is covered by a layer of oxychlorid cement. This cement offers an effective barrier against reinfection. Secondary invasions from areas about the empty apical region of pulpless teeth by means of hematogenous systemic infection do occur, in the same manner as, conversely, they are observed in other organs of the body from focal infections. Reinfection from marginal pericementitis which by continuity spreads toward the apex does also occur. Such cases are comparatively rare and are easily diagnosed.

The great majority of reinfections may be explained upon the basis that the infective organisms have remained undisturbed within the body of the tooth structure and have escaped destruction during the supposed process of sterilization. It should be remembered that one solitary organism left unharmed may be responsible for the reinfection, as the power of self-propagation of bacteria is enormous. As Miller estimated, one single cell may produce 16,000,000 offspring within twenty-four hours. The unharmed organisms must of necessity have found a safe harbor within the complex system of dentinal tubuli, which traverse the dentin everywhere, or in the finer deltoid canals branching off from the main root-canal near the foramen.

By an ingenious method of counting Roemer succeeded in estimating the number of these tubules. Near the dentino-enamel junction he counted some 14,700 tubuli within the area of 1 sq. millimeter. The number of these tubuli progressively increases in the direction of the foramen, in which he found 37,600 tubuli per square millimeter. The width of these tubuli according to Koelliker may be estimated as being from 1.3 to 4.5 microns about the foramen, while the average size of a streptococcus is about 1 micro-millimeter, hence we readily understand how these organisms find

suitable hiding-places within the tubuli. The root-canals at their terminal ends near the foramen, as stated above, show marked deviations. Hess has found that in 25 to 80 per cent. of cases in a very large number of examined teeth of all types of the human denture, from two to five, and sometimes even more, additional foramina could be observed.

From the clinically observed facts, it is evident that the exhaustion of any medicament sealed into the root-canal occurs within a day or two. The interior of the dentinal tubuli cannot be reached by the superficially applied antiseptic, as no direct contact is secured, hence the quick self-propagation of the retained infective organisms which grow luxuriantly in the empty or ill-filled root-canal. It is self-evident, therefore, that the complete mechanical occlusion of the root-canal in its entirety offers the only absolute guarantee for safety as regards reinfection. The complete corking up of every tubule and every accessory foramen is the final desideratum we must strive for in the permanent filling of a root-canal. We thereby deposit, as it were, an antiseptic which mechanically inhibits the confined infective organisms and prevents renewal of their growth.

The usual procedure at present in vogue with many practitioners is to leave doubtful canals unfilled for some time in anticipation of some future disturbance. Such unfilled canals, as experimental clinical evidence clearly indicates, usually become reinfected within a week or two;—hence our tenacious adherence to the orthodox doctrine that an incipiently infected root-canal of a tooth *in situ* may be rendered aseptic upon its surface by the use of certain antiseptic procedures, but that it is impossible to sterilize the deep-seated infected tooth structure.

As reinfection is primarily caused by organisms left undisturbed in the dentinal tubuli, it should be an imperative rule with the operator to fill at once as completely as possible every root-canal which has been found sterile at the last sitting of the patient.

TREATMENT OF INFECTED ROOT-CANALS.

The most serious question that confronts the dental profession today—and for that matter has also confronted it in the past—is that which is involved in establishing absolute sterility in an infected root-canal. The solution of this problem in a truly scientific manner necessitates the determination by bacteriologic tests of the sterility established in each individual case. While the writer realizes that the carrying out of such procedures in the average dental office of today will meet with numerous difficulties, due to the fact that the older members of our profession have not had sufficient training in this direction, nevertheless there exists no valid reason why it should not be done by the recent graduate who has received adequate instruction in laboratory technique or through a bacteriologic laboratory.

The time is not far distant when the public will demand a laboratory diagnosis of serious root-canal infections, for the same reason that a bacteriologic examination of a diphtheritic throat is demanded at present. Since the sequences of imperfect root-canal sterilization in the form of focal infections resulting in metastatic disturbances of distant organs are of common occurrence, it must follow that our present methods of establishing the perfect sterility of an infected root-canal are inadequate.

From a logical deduction based upon the above-discussed pathology of infected root-canals it is evident that its treatment resolves itself into three definite phases—the mechanical, the chemical, and the therapeutic procedures. Mechanical manipulations are intended to dispose of the débris of the dead pulp, chemical procedures are primarily applied for the purpose of facilitating the removal of obstructions, and therapeutic applications are utilized to overcome septic conditions.

STERILIZATION.

It should be an inflexible rule with the operator to enter a root-canal only

with absolutely sterile broaches, absorbent paper or cotton points, gutta-percha cones, etc. The larger instruments, such as pliers, canal pluggers, broach-holders, etc., are sterilized by boiling in the usual way in any one of the ordinary sterilizers or a Penz steam sterilizer, while the delicate broaches are sterilized by chemical means, as they lose much of their rigidity by boiling in water, consequently they readily break.

A simple and absolutely satisfactory method of sterilization consists in immersing the broaches in a concentrated solution of sodium hydroxid for an hour. The alkali solution possesses the additional advantage of dissolving organic debris entangled in the barbs of the broaches. A suitable solution is made by dissolving the contents of a 1-lb. can of commercial sodium hydroxid in a gallon of water. A heavy precipitate occurs, which is allowed to settle. A glass-covered preserving jar of about one pint capacity, or still better a tall chemical dish with glass cover, is filled with the solution, and the mechanically cleansed broaches, placed in a glazed Gooch porcelain crucible with perforated bottom, are immersed in the solution. After remaining in the solution for about an hour the crucible is removed with pliers, drained off through the perforated bottom, and transferred to a second jar containing an alcohol-glycerin mixture consisting of one ounce of glycerin to seven ounces of alcohol.

A convenient and simple sterilizer for absorbent points and gutta-percha points has been recently devised by the writer. [See illustration, DENTAL COSMOS, December 1918, page 1079.] A colorless screw-cap bottle of about one ounce capacity is provided with a piece of thick cotton roll of about one inch in length, which is fastened to the interior of the cap with sealing-wax. About five drops of dichloramin-T solution are placed upon the lower end of the roll, where it is quickly absorbed. The chlorin compound is renewed about once a month. The paper, cotton, or gutta-percha points are placed in the bottom of the dry bottle, the screw cap is put into position,

and the permanent sterilizer is completed. The efficiency of this simple device has been repeatedly tested by plating out the points; they have always been found to be absolutely sterile. The exposure of the clear glass bottle to the light rays causes a very slow liberation of chlorin. The gutta-percha cones and paper points as obtained in sealed packages from the manufacturers are usually sterile, and the little device suggested is primarily intended to preserve their sterile condition.

As a very convenient means of holding the necessary drugs, sterilizing broaches, etc., the writer has suggested an aseptic medicament tray. [See DENTAL COSMOS, December 1918, page 1078.] The elongated depression in the tray is filled with the same alcohol-glycerin mixture as mentioned above, in which broaches, root-canal cleaners, etc., may be kept immersed while working on the tooth.

CHEMICAL PROCEDURES.

For the chemical disintegration of the pulp detritus, but primarily for the purpose of assisting in the opening of obliterated root-canals, two specific methods are in vogue, namely, the alkali method, as introduced by Schreier in 1892, and the acid method, as advocated by the late Dr. Callahan in 1893. Schreier's alkali method is intended to destroy the organic substances by means of the freshly formed hydroxids of potassium and sodium derived from an alloy of potassium and sodium in the presence of water, thereby rendering the remaining inorganic debris more friable and offering less resistance to the advancing broach or reamer; while Callahan's sulfuric acid treatment produces the opposite effect, *i.e.* it destroys the inorganic substances by dissolution and carbonizes the remaining organic material. Both methods have their advocates, and as they virtually accomplish the same purpose it is difficult to recommend one method as superior to the other. The preference in selecting one specific method is largely a matter of personality; however, a most important

physical property possessed by the alloy and not possessed by the acid should be mentioned, giving the alkali method some degree of advantage over the acid treatment. This property manifests itself as a pronounced capillary affinity of the freshly formed hydroxids for moisture, consequently the caustic alkali solution penetrates into those minute apertures of the root-canal which a broach cannot reach and in which the acid will not flow. The writer has observed that the opening of completely obliterated canals is often materially facilitated by alternating the alkali and acid methods. Both methods incidentally destroy the offensive odor of putrescence, which is always very pronounced in a closed root-canal and less so in an open canal. However, it should be clearly understood that the complete absence of foul odors is by no means an indication of sterility.

Dental potassium-sodium (kalium-natrium) usually consists of one part of metallic potassium and two parts of metallic sodium melted together beneath kerosene. It is of a pasty consistence and resembles mercury in appearance. The alloy is supplied in small glass tubes sealed with wax or paraffin to protect it from moisture. *In using this alloy, a barbed tantalum or an iridio-platinum broach is thrust through the paraffin stopper or directly into the broken-off upper end of the tube. Steel broaches are not to be recommended for this work; the alloy disintegrates the metal, and as a consequence the broaches frequently break in the canal.* The very small quantity of the paste adhering to the broach is worked into the pulp debris. At once a chemical decomposition of the contents of the root-canal takes place, manifesting itself by heat and a hissing sound with the escape of gas.

Potassium-sodium alloy in the presence of water is changed at once into its hydroxids with the liberation of hydrogen. The hydroxids dissolve in the remaining water and form a more or less concentrated caustic alkali solution. The putrescent pulp, as stated above, contains water, fat, fatty acids, gases, and the debris of decomposed protein

material. The rationale of the action of the potassium-sodium alloy on the putrescent pulp debris present in a root-canal may be summarized as follows: Fat and fatty acids are changed to soluble soaps. The protein substances are rendered soluble by the caustic hydroxid solution, and the liberated hydrogen forces the undissolved debris to the surface of the canal. The calcareous deposits in the lumen and upon the walls of the canals lose their crystalline structure and become friable and thereby offer less resistance to the advancing broach. The offensive odor of putrescence is almost instantly destroyed.

Copious washing with water will remove the saponified contents of the canal, and on drying, its clean, ivory-white walls are visible. The substitution of the hydroxids or sodium for the metallic alloy is not to be recommended; their application is difficult and their physical nature does not lend itself to this procedure so readily as the alloy from which the above hydroxids are obtained *in statu nascendi* during their application. The tube containing the alloy must be hermetically sealed directly after using, to prevent the decomposition of the alloy by moisture absorbed from the air. If the sealing is not carried out in a proper manner, the operator will find that the contents of the tube will change to a hard, crystalline mass, *i.e.* the hydroxids of the two metals.

The sulfuric acid method for opening obstructed root-canals has found many admirers among the practitioners, and it is probably more widely employed at present than any other chemical procedure. Other acids, such as hydrochloric, nitric, nitro-hydrochloric, and phenol-sulfonic acid, have been advocated for this purpose during the last twenty-five years. The strength of these various acids as used for this specific purpose should be carefully noted, as it varies greatly. Sulfuric acid is usually employed in approximately a 50 per cent. solution, hydrochloric acid in a 10 per cent. solution, nitro-hydrochloric acid either pure or in a 50 per cent. solution, while phenol-sulfonic acid is used in its

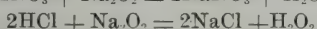
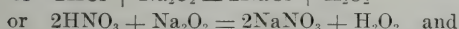
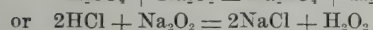
pure form only. The therapeutic absurdity of the latter compound has been dealt with by the writer on a former occasion, and consequently it is omitted in the present discussion. The substitution of phenol-sulfonic acid for this or any other purpose in which sulfuric acid is indicated in dental therapeutics means the application of a decidedly inferior remedy.

Nitro-hydrochloric acid (aqua regia), as introduced by G. W. Weld in 1897, is the most efficient acid for the above purposes. It should preferably be applied in a 50 per cent. solution. On account of its strong caustic properties extreme care is required in handling it. This acid should be preserved in glass-stoppered bottles and kept outside of the operating room, as its fumes are most destructive to metallic instruments. A 50 per cent. solution of this acid may be prepared as follows:

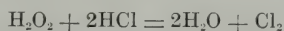
Nitric acid,	1 dram (4 cc.)
Hydrochloric acid,	4 drams (16 ")
Water,	5 " (20 ")

It may be applied upon a steel broach. Concentrated aqua regia has practically very little effect on steel, as the broach is at once covered by a protective oxid by the action of the evolved nitrosyl chlorid, which checks the further action of the acid upon the metal.

Whatever acid is employed should be neutralized by sodium dioxid—as recommended by Kirk in 1893—not by sodium bicarbonate, which is practically of very little value for this specific purpose. The sodium dioxid is carried into the root-canal by means of a broach previously dipped into chloroform; the latter liquid merely acts as an indifferent conveyor of the sodium dioxid to the root-canal, which, if water or ordinary alcohol were used, readily decomposes. The chemical interchange between the various acids may be portrayed by their respective reactions as follows:



The freshly formed hydrogen dioxid of the last reaction combines with the available hydrochloric acid and forms nascent chlorin:



There seems to be quite a divergency of opinion concerning the self-limiting action of these acids upon tooth structure. Sulfuric acid in 50 per cent. solution is self-limiting. A tooth placed in this acid will be coated within a day or so on every accessible surface with freshly precipitated insoluble calcium sulfate, and consequently no further action occurs. A tooth placed in 10 per cent. hydrochloric acid, or in pure or in 50 per cent. nitro-hydrochloric acid, will be completely dissolved in two or three days; these acids form soluble calcium salts. The greatest solvent power is exhibited by 50 per cent. nitro-hydrochloric acid.

From a clinical point of view it is readily understood that the small quantities of either acid pumped into a root-canal, when used with caution, will do no harm, especially when neutralized by sodium dioxid. It is to be understood, however, that no acid should be forced through the foramen.

THERAPEUTIC PROCEDURES.

Soon after the inauguration of the antiseptic era in surgery in 1868, by Lister, dentistry adopted his methods for the treatment of root-canals in an empiric way by using phenol as advocated by Witzel in 1873. Since then, innumerable other drugs and drug compounds have been recommended at various times for this purpose, among which may be mentioned creasote, chloro-phenol, camphorated phenol, lysol, cresol, creolin, beta-naphthol, salicylic acid, hydrogen dioxid, zinc chlorid, mercury bichlorid, silver nitrate, iodine solutions, iodoform, the essential oils, thymol, eugenol, eucalyptol, Black's 1-2-3, sodium dioxid, formaldehyd, electro-sterilization (ionization), dichloramin-T, and many others. From a clinical point of view the cresol-formalin mixture as intro-

duced by Gysi in 1899, and which was widely popularized by Buckley in 1904, has received greater approval than any other medicinal compound recommended for such purposes.

The true criterion of the efficiency of an antiseptic is its bacteriologic test upon clinical cases. The high standard of the germicidal activity of formalin has been frequently established by rigorous experiments. Clinical data collected in the early days of the use of the above mixture pointed to most favorable results. In due time, however, it was observed that, while "clearing up" of an infected root-canal, as far as the ordinary diagnostic evidence is concerned as applied in the average dental office, *i.e.* absence of foul odor, occurred much more rapidly by the use of this mixture than by employing any of the numerous other drugs usually advocated for this purpose, nevertheless secondary manifestations about the periapical tissues were of frequent occurrence. These disturbances are an indication that the supposed sterility of the canal was not obtained at the time of its treatment with the cresol-formalin mixture, or that this compound produces a predisposition of the periapical tissues to future infections. To be sure, dental literature is pregnant with statements such as this (relating to the cresol-formalin mixture): "This dressing should remain for at least three days, by which time the remedy will have sterilized the entire tubular structure of the dentin, thus establishing asepsis."

As no bacteriologic proof is furnished to substantiate the claim, this empiric statement does not carry any scientific weight, and it is out of harmony with existing facts. Asepsis of an infected root-canal can be temporarily established by applying mechanical and chemical measures, but complete sterilization of "the entire tubular structure of the dentin" in a tooth *in situ* is impossible with the methods at present in vogue.

In regard to the application of a powerful antiseptic drug for the treatment of infected root-canals, one should be always mindful of the following facts:

(1) The agent must be able to develop the highest degree of antiseptic power without doing harm to the periapical tissues.

(2) It must maintain its activity for at least twenty-four hours when sealed into the root-canal.

(3) It must not cause pain.

(4) It must not discolor the tooth structure.

Of all the drugs above enumerated, only a very few answer these requirements. Without entering into a lengthy discussion of the merits or demerits of these drugs, it may be stated that, in general, the aromatic series, *i.e.* phenol and its isomers, are caustic when applied in concentrated solution. The metallic salts are strong precipitants of albumin; incidentally, some of these salts, *i.e.* mercury, bichlorid, and silver nitrate, permanently discolor the tooth structure. Iodoform, on account of its most disagreeable odor and other drawbacks, cannot be recommended for the work, and the iodine solutions produce lasting stains. The essential oils do not possess sufficient antiseptic power as compared with other drugs. Formaldehyd in the strength in which it is usually applied for root-canal treatment will always destroy the soft tissues when brought in contact therewith either directly or in vapor form, in the same manner as the ill-fated desensitizing paste by its formalin content eventually kills the pulp through any thickness of sound dentin.

As has been already stated, no antiseptic treatment now in vogue will permanently sterilize a once-infected root-canal.

CHLORIN AS AN ANTISEPTIC.

Of all known antiseptics, chlorin freshly prepared and in the presence of moisture and a suitable temperature possesses the highest germicidal power. In suitable concentration, especially in an oily solution, it is harmless to the periapical tissues, and maintains its activity for about twenty-four hours when sealed into a root-canal. The oily

chlorin solutions will not cause pain, and do not discolor but rather "bleach" tooth structure.

PREPARATION OF DICHLORAMIN-T SOLUTION.

Regarding the concentration of the solution of dichloramin-T for the purpose of treating infected root-canals, we have found that a 5 per cent. solution of the salt in chlorinated paraffin, *i.e.* chlorosane, answers our purpose quite satisfactorily. We have heard an opinion expressed to the effect that a 5 per cent. solution is too irritating when used in root-canal work. We cannot subscribe to such assertions; we rather believe that the pain resulting from its application was due to two causes—a spoiled solution and a faulty technique.

Solutions of dichloramin-T preserve their activity for a limited time only; they usually deteriorate within two or three months, and therefore it is best to prepare a convenient quantity such as may be readily used up within a month or so. To prepare an ounce of the solution, 25 grains of dichloramin-T are placed in a dark amber-colored glass-stoppered bottle, which must be absolutely clean and free from moisture. One ounce of chlorosane is added, the whole is thoroughly shaken, and the bottle is placed in a pan containing very hot water or upon a radiator or other source of indirect heat. Within a quarter of an hour complete solution usually results. Direct heat in making the solution is to be avoided, as it is liable to lessen the efficiency of the compound. The solution is ready for immediate use; filtering is not necessary. As stated above, only dark amber-colored or black bottles should be employed as storage vessels; blue glass does not protect the solution against the actinic effects of strong light.

Solutions of dichloramin-T must be carefully protected against heat, light, water, alcohol, and most metals; in fact, most common substances have a strong affinity for chlorin, hence the ready decomposition of this solution when

brought in contact therewith. Whenever the solution becomes turbid and forms a deposit of crystals in the bottom of the bottle or develops a pronounced odor of hypochlorous acid, it should be discarded. Fresh solutions, if chilled, may temporarily become cloudy, or even precipitate, owing to the separation of either dichloramin-T or of solid paraffin. Slightly warming the solution quickly restores its usefulness.

For office purposes, it is best to keep the dichloramin-T solution in an amber-colored office-preparation bottle with a ground cap. [See DENTAL COSMOS, December 1918, page 1075.] A small glass rod or tube kept in the bottle readily assists in obtaining the few drops necessary for each treatment, to be placed upon an aseptic glass tray. Under no condition should pliers charged with cotton, etc., be introduced into the preparation in the bottle, and no unused portions of the solution must be returned to the stock-bottle.

Dichloramin-T shares with other chlorin compounds the property of being a very active lymphagogue, *i.e.* by it the amount of wound secretion, especially in the beginning of the treatment, may be considerably increased. The writer's attention has been frequently drawn to this fact by fellow practitioners who have tried the compound in treating root-canals, and who complained of the increased secretions from the canals—which, incidentally, influence the granulation of the wound most beneficially.

The application of the antiseptic principle as utilized in wound sterilization depends primarily upon three definite conditions:

- (1) Absolute contact of the antiseptic with the infecting organism.
- (2) Time during which this contact is maintained.
- (3) Sufficient concentration of the antiseptic at the point of contact.

Absolute contact between the antiseptic agent and the substances to be acted upon must be rigidly observed, as no antiseptic is known to act at a distance.

Finally, the permissible concentration

of the antiseptic depends largely upon the tolerance of the tissues with which it is brought in contact, and is usually determined by clinical observation. The concentration of the antiseptic solution determines its mass action which can be safely employed for tissue sterilization.

After the root-canal has been suitably prepared by mechanical and chemical means so as to present a conical-shaped tube, a freshly flamed wire is inserted to the very apex and bent so as to form a shoulder near the pulpal wall, and a roentgen picture is taken. The tooth is again placed under the rubber dam, the wire removed, and the canal washed with sterile water and dried out. Sterile paper points assisted by a few drops of acetone and warm air are serviceable for this purpose. Fair dryness of the canal must be insisted upon, as otherwise the future treatment with dichloramin-T is materially impaired.

A suitable paper point is now saturated with dichloramin-T, carried to the root-canal, and with a pumping motion an attempt is made to coat the walls of the canal, and if possible a droplet is forced into the periapical space. The use of the warm-air blast is of material assistance in getting the oily solution into the finer ramifications of the canal. The warm-air blast is recommended in this connection solely for its mechanical effect in aiding the diffusion of the dichloramin-T throughout the dentin. The natural moisture present in the tooth structure will assist in the production of the nascent chlorin from the reaction of the dichloramin-T with the water of the organic structure of the tooth. A fresh point carrying a drop or two of the chlorin solution is now slowly forced into the canal to its very end, and is immediately sealed with a suitable retainer. As stated above, close contact of the antiseptic solution with the walls of the root-canal, and if possible with the surface of the involved infected area within the periapical tissues, is essential to obtain therapeutic results.

The first application remains undisturbed for twenty-four hours. On the return of the patient the point is re-

moved aseptically and carefully examined in regard to its color, odor, etc.

A second dichloramin-T treatment is placed in the dry canal and allowed to remain another twenty-four hours, while a third application is usually left in position for forty-eight hours. The paper cone removed at the last sitting must show no discoloration, it must have a distinct odor of chlorin, and it must be fairly free from absorbed exudates. If possible the first or second treatment should not be left in the canal over twenty-four hours; at the end of this time the chlorin compound is completely exhausted, and usually a pronounced flow of lymph, as referred to above, is the sequence. If at the last treatment the canal is found satisfactorily clean, no time should be lost in filling it at once.

THERAPEUTIC EVIDENCE.

Regarding the existing sterility of a primarily infected root-canal as treated by the above-outlined dichloramin-T method, it should be emphasized that rigorous bacteriological tests were made in numerous instances by plating out scrapings from the walls of the canals before and after they had been pronounced clinically ready to fill. These tests consisted in subjecting the scrapings to incubation upon agar, bouillon, etc. After exposure in an incubator for various lengths of time, usually from forty-eight to seventy-two hours, it was observed in all instances that the growth from these scrapings of the treated canals were negative, *i.e.* no cultures were obtained.

"The day of authority in any branch of science has gone by;—statistics on the table, please." This eminently logical dictum of Prof. Karl Pearson portrays a sound scientific doctrine, and it should be insisted upon as the crucial test of therapeutic evidence of any new remedy. In the discussion of the clinical efficiency of a drug, the *post hoc ergo propter hoc* type of logic is only too apt to creep in, which naturally leads to a biased reasoning. The raw material of science consists of uncomfortable facts,

hence the logic of Aristotle, which ignores this evidence, must be forsaken in an inquiry into the efficiency of a therapeutic agent. On a former occasion, regarding the methods of research, we have stated that—

In investigation into a remedy, or, for that matter, any biologic problem, the following four rules of research must be observed:

(1) Generally known observations or facts are collected.

(2) Hypotheses are drawn from these observations and are explained.

(3) Other crucial facts (experiments) are collected to test these hypotheses; and

(4) A second set of facts is collected, and from it are drawn the final conclusions or verifications.

Omitting one of these rules, or applying illogical reasoning based on analogy, or inductive instead of deductive methods, leads to a false analysis of the problem under consideration.

The final proof of the therapeutic efficiency rests upon the application of the remedy to the patient in conformity with the good old truism, "The proof of the pudding is in the eating." However, the real problem is by no means fully substantiated by clinical evidence only; a causative connection between the remedy and the event has to be established.

The question now arises, What proofs have we in regard to the therapeutic efficiency of dichloramin-T in the treatment of infected root-canals?

(1) Generally known observations. Up to the present (October 1918) Dr. Lee and his co-workers announce that "Records have been obtained from 19,040 completed cases in civil surgical practice which have been treated with this agent, and Captain Sweet, U. S. A., base hospital No. 10, France, in July 1917 obtained the records of a total of 4903 cases treated with the preparation."

(2) Hypotheses drawn from these observations. Since the infection of a root-canal and the subsequent suppuration of the periapical tissues does not

differ from any other wound infection, it is *a priori* logical to assume that the remedy is also suitable for the treatment of such cases.

(3) Crucial experiments to test these hypotheses. Bacteriologic tests of the infected root-canals before and after treatment verify the general claims made for the therapeutic efficiency of dichloramin-T.

(4) Final verifications drawn from a second set of collected facts. After one year of observations, clinical inspection of a set of experimental cases, verified by roentgen pictures taken at suitable intervals before and after treatment, pronounces the complete eradication of the initial disease focus—hence a cure.

TECHNIQUE OF FILLING ROOT-CANALS.

A systematic analysis of the various steps involved in the practice of filling root-canals as based upon our previous discussion in regard to reinfection, resolves itself into the following procedures: Dehydration of the sterile root-canal, infiltration of the dentinal tubuli with a very thin rosin solution, evaporation of the rosin solvent, coating of the varnished canal walls with a thin film of gutta-percha paste, the final solid plugging with a gutta-percha cone and covering of the pulp chamber with zinc oxychlorid cement. A final roentgenogram is essential for checking up the operation.

DEHYDRATION.

The *sine qua non* of a successful root-canal filling is an absolutely dry root-canal. To accomplish this end, certain physical procedures are in vogue, namely, the hot-air blast, the electrically heated root-dryer, the heated wire (of which the Evans root-dryer is probably the best known prototype), bibulous paper cones, cotton, etc. To facilitate the removal of moisture, hygroscopic chemicals, such as alcohol, chloroform, ether, and other substances, are often used in conjunction with the above enumerated means. These compounds, with the exception of alcohol, have little

affinity for water, and hence are of no practical value. As already stated, acetone is admirably suited for this purpose.

In drying out a root-canal, it should be borne in mind, that the removal of its natural moisture, or any fluid placed in it, is well-nigh impossible with the much-lauded hot-air blast if the foramen is closed. A few trials on an extracted tooth or a glass tube drawn out to a fine solid point and filled with water or any other of the fluids enumerated will readily convince one of the fallacy of this conception. The fluid will move back and forth on the elastic cushion of air confined in the end of the tooth or the tube, or, if no air is present, the heated air blast will practically make no impression on the moisture column. The removal of moisture is usually best accomplished by using bibulous paper cones in conjunction with a heated metallic root-canal dryer. The cessation of the hissing sound following the introduction of the hot wire indicates that the desired effect has been successfully achieved. In passing, it is well to remember that over-drying the tooth structure is a dangerous procedure. If more or less of the water which holds the gelatinous matrix of the tooth in colloidal solution is removed by overheating, that tooth is proportionally weakened against physical or chemical insults, a fact which is well borne out by clinical observation. After the root-canal is freed from its natural moisture it is flooded with acetone and dried again with the hot wire point. The object of this procedure is to remove every particle of moisture from obscure nooks.

INFILTRATION OF THE DENTINAL TUBULI WITH A VERY THIN ROSIN SOLUTION.

The solution required for this purpose consists of—Rosin 15 grains, acetone $\frac{1}{2}$ ounce; keep in a well-stoppered bottle. With a few wisps of cotton upon a broach the solution is pumped into the root-canal immediately after dehydration, and its solvent is evaporated with the warm-air blast. This process is repeated

so as to have a fair assurance that every tubule is sealed.

COATING THE CANAL WITH A GUTTA-PERCHA PASTE.

A most suitable paste which will not shrink is prepared as follows: One-half ounce of gutta-percha base-plate cut into small pieces is put into a suitable perfectly dry wide-mouth bottle and covered with one-half ounce of paraffin oil. The bottle containing the mixture is placed on a heated sand-bath or upon a hot radiator until complete solution is obtained. On cooling, the solution has the consistence of butter in cold weather. With a broach a very small quantity of this paste is transferred to the varnished canal and spread over its wall. A touch of warm air will greatly assist in its even distribution. The object of using this paste is primarily to place a lubricant in the canal for the final gutta-percha cone, and secondarily to occlude every uneven nook and corner by an unshrinkable material which is not directly reached by the solid cone. We again emphasize that *only the smallest possible quantity of paste should be employed.*

FINAL FILLING OF THE ROOT-CANAL.

Before starting the final operation, the roentgenogram with the diagnostic wire in position is carefully examined, so as to obtain a fair conception of the size, general outline, and length of the root-canal. A suitable sterile gutta-percha cone which approximately fits the canal is selected from the cone sterilizer. Its extreme point is cut off, mounted upon the narrowed end of a suitable sterile root-canal plugger, and carried to the canal. The cone must never be touched with the fingers. With a combined lateral and pumping motion the cone is finally very firmly pressed to place. Slow, firm, and persistent pressure lasting for a minute or two is essential for this last operation, so as to drive the cone, if possible, to the very apex or even slightly beyond it. Under

the persistent firm pressure the semi-plastic gutta-percha will adapt itself to the irregularities of the canal. The remaining portion of the canal is filled with gutta-percha and the pulp chamber is occluded with oxychlorid of zinc ce-

ment. A final roentgenogram may now be taken to check up the operation.

40TH AND SPRUCE STS.

[See also *Discussion*, as reported under "Proceedings of Societies," this issue.]

The Practical Use of the Dental Radiograph.

By STERLING V. MEAD, D.D.S., Washington, D. C.

(Read before the Maryland State Dental Association, Baltimore, June 11, 1919.)

RADIOGRAPHY has become one of the most important branches of dentistry. The results achieved when using the radiograph as a diagnostic aid are wonderful, and especially is this true when locating foci of infection causing general systemic disturbances. It is therefore essential that all dentists make use of the radiograph, and at least be able to interpret its findings correctly. We see daily many mistakes being made through poor radiographic work and misinterpretation. It therefore behooves all of us to learn the disadvantages and faults of the radiograph as well as its advantages.

Radiography is doing more to elevate the dental profession than anything else. There is a great responsibility being placed upon dentistry by reason of the disclosures of the radiograph, and the profession is fast proving capable of assuming this responsibility.

From our physics we have learned that the spectrum consists of seven primary colors: Violet, Indigo, Blue, Green, Yellow, Orange, Red. But the complete spectrum shows rays beyond both the red and the violet, viz, the ultra-red, bi-ultra red, and tri-ultra red; and the ultra violet, bi-ultra violet, and tri-ultra violet. The group in which we are interested, as pertaining to radiography, consists of the ultra-violet, bi-ultra violet, and tri-ultra violet rays.

The ultra-violet is the least penetrative of all the violet rays. It is used in therapy work. The bi-ultra violet ray has a greater penetrative power than the ultra-violet. In dentistry these bi-ultra violet rays have been used in the treatment of pyorrhea alveolaris, by means of vacuum electrodes especially designed for the purpose.

The tri-ultra violet ray has the shortest wave-length of the three violet rays, and therefore, according to the law of penetration, it has the greatest penetrative power. It will penetrate metallic substances, such as gold, platinum, silver, and all the densest metals in thin sheets.

The therapeutic properties of the tri-ultra violet, or the X-ray, are very marked. One of its principal effects is its *analgesic power*. I have frequently found that in the short exposure necessary in taking a radiograph, the pain from an acute attack of neuralgia or from an ulcerated tooth is quite relieved. Patients have often told me of this, but I thought nothing of it until I read about the same experience of others. However, this is a most dangerous method to use for the relief of pain!

The X-ray is produced by running an interrupted electric current of high voltage through a bulbular glass tube from which the atmosphere has been ex-

hausted to quite a high degree of vacuum. The X-ray, therefore, may be considered as light-waves with an inconceivably rapid rate of vibration and invisible to the eye.

The X-rays cast a shadow upon a film or plate of the object through which they pass. The radiograph differs from other shadow pictures, however, in that the light passes through the object that casts the shadow; the picture we obtain is not a photographic reproduction of the parts radiographed. The X-ray, therefore, shows the varying degree of density of the parts through which it passes. The more dense the object through which these rays pass, the lighter it will show upon the negative film, and conversely, the less dense the object radiographed, the darker the area shown upon the negative film. Advantage is taken of this in locating oral infection. This does not mean that the X-ray is a picture of disease, but it is a picture which will aid greatly in determining if disease is present.

THE USE OF FILMS AND PLATES IN DENTAL RADIOGRAPHY.

It is always necessary to use discretion in choosing the film or plate. There is a difference in the technique for different conditions. Films are furnished which are known as the "slow" film (improperly termed *positive* by some) and the "fast" film (improperly termed *negative* by some). The slow film is furnished in three sizes suitable for dental work. The No. 1 size is the one most often used for showing suspicious areas of bone disintegration or destruction, as it will show the detail more clearly. The best results are obtained with the Buck film; the Eastman film is also very good.

The No. 2 size is practically the same as the No. 1 and will give the same results, but I can see no advantage in it, because we can show only a certain number of teeth to the best advantage from one angle, and we can get these upon the small film, which is easier to hold in the mouth. The No. 2A size is

very useful in showing unerupted teeth or impacted teeth, or in showing large areas of infection or cysts. It is not well, however, to use these when trying to locate apical infection, as I have seen a great many mistakes made by those who use them in this way. In these pictures there are always distortion and shadows, and the small size will show more detail.

While plates do not show detail as clearly as films, they are often very useful in locating impacted teeth which are in positions inaccessible for the use of the small film. They are also sometimes useful in showing cysts and large areas of necrosis, and in certain cases where it is difficult to get the film into the mouth. Plates or large extra-oral films are indispensable, however, for use in connection with antral empyema. Upon the plate, when an antero-posterior view is taken by placing the nose and chin upon the plate, the two antra can be compared. We must remember that the antrum is an air-space covered with thin bone, and when we radiograph this area upon a plate the rays will pass through the normal antrum more quickly than the surrounding dense bone, and therefore the corresponding area upon the plate will show dark. When there is an obstruction to the ray, such as pus or growth of any kind, there will be less action upon the plate corresponding to this area, and the antrum will show cloudy or whitish in appearance.

The small film is not used for the diagnosis of pathological conditions of the antrum, but it is nevertheless an aid. Where we suspect or where we know there is sinus trouble, the small film is useful to locate the foci of infection at the apices of roots.

There are also a number of fast films upon the market, but these are not so useful, and should only be used where we have to sacrifice detail for speed.

POSITION OF FILMS IN THE MOUTH.

Many dentists do not appreciate the necessity and value of more than one exposure of the same area in many cases.

In most cases not more than two teeth will appear in the center of the field, and it is unwise to endeavor to show more upon the one exposure. I have developed a very satisfactory technique for the whole mouth, and when I want a clear view of each individual tooth, I proceed as follows:

Upper central and lateral incisors, upon one film held vertically.

Upper cuspid, upon one film held vertically.

Upper first and second bicuspid, upon one film held vertically.

Upper first molar, upon one film held horizontally.

Upper second molar and third molar, upon one film held vertically.

Lower four anterior teeth, upon one film held vertically.

Lower cuspid, upon one film held vertically.

Lower two bicuspid, upon one film held vertically.

Lower molars, upon one film held horizontally.

I find it necessary very often to vary from this arrangement. The number of teeth, their position in the mouth, purpose of the radiograph, shape of mouth and palate, and muscular attachments, all regulate the placing of the film in the mouth.

STEREOSCOPIC RADIOGRAPHY.

We have all heard and read about this phase of dental radiography, and we have been simply bewildered by the description of special apparatus, and the difficult technique necessary. I believe that where it is necessary to employ stereoscopic radiography we can obtain the results in a simple and easy way.

Where we take two photographs of an object with a kodak, moving the kodak $2\frac{1}{2}$ in. (width between eyes) for the second exposure, we can obtain perfect stereoscopic films, because it is possible to have the objects standing apart. We will not be able to obtain the same results in the mouth, because the distance between the film and the teeth is so short that only a slight stereoscopic

effect can be produced. Even this small amount is very advantageous in certain cases, such as impacted teeth, perforations, and in certain cases of apical infection where the bone destruction extends labially or lingually to teeth not initially involved.

INTERPRETATION OF RADIOGRAPHS.

The radiograph, or roentgenograph, is a valuable diagnostic aid in dentistry when interpreted by one thoroughly schooled in dentistry and one who understands what it really shows and who knows its defects and limitations. It is entirely wrong for physicians and others who have no knowledge of dentistry to undertake to interpret these pictures for either the patient or for dentists, as invariably there is a misinterpretation of what is really shown.

The prerequisites for correct interpretation are—

(1) Absolutely clear views, showing distinctly the bone detail and the space occupied by the peridental membrane surrounding the tooth.

(2) A thorough knowledge of the anatomical and histological structure of the part radiographed.

(3) Proper radiographic training.

(4) A thorough knowledge of dentistry.

(5) Clinical examination.

The most frequent cause for misinterpretation of films and plates is poor pictures. Unless radiographs are absolutely clear they should be re-taken, as it is never well to draw upon your imagination and see things in the radiograph which are not present.

When examining a film it is well to study the entire radiograph carefully, comparing the appearance of the bone structure in a suspicious area with the bone in some other part of the picture and in other parts of the mouth.

Every dark spot shown upon the film is not infection, by any means, and I shall show numerous instances where mistakes have been made in this respect. One would not be safe, either, in assuming that there was no infection if there

were no bone destruction shown upon the radiograph, as it is entirely possible to have considerable infection in the tissue and no bone destruction or disintegration shown. This, however, is comparatively rare. When a radiograph is taken of a devitalized tooth and a dark area shows at the apex, it probably means that there is infection, because naturally the bone destruction is caused by infection, and unless the infection has been successfully eliminated by assisting nature it will still remain.

I say that this dark spot *probably* means infection, because there are cases where it does not; for when there has been a radiograph taken of a tooth and infection is found at the apex, and an operator successfully clears up this infection (if it is possible to do so), and another radiograph is taken before nature has an opportunity to fill in the destroyed area, the dark area will still be shown. It takes from six months to two years to fill in these areas, depending upon their size. I see instances very often where operators find these areas by the use of the X-ray, undertake to treat them and cure them, and later, within a few days, want another picture to ascertain if they have successfully perfected a cure. Now you will understand from what I have just said that this second radiograph would be of no value whatever excepting to prove a root-filling, unless the operator waited a sufficient length of time for bone regeneration. So you will understand that it is very unwise for anyone to undertake to interpret any film without having a knowledge of the case, and the radiograph should only be used as an aid to supplement the clinical observation of the operator.

A great many men think the radiographer should be able to determine in every case from the radiograph whether or not a tooth is vital, and in cases in which they fail to do so, either on account of inability to read the film or in cases in which such determination is impossible, many dentists fail to appreciate what it shows them even in this case. Even though there are a few

cases where it is impossible to determine whether or not the tooth is vital from the radiograph, it at least eliminates the possibility of an area of bone destruction or other complication, and it is a simple matter to test the vitality of the pulp with a pulp tester. Every specialist should have a pulp tester for these specific cases and it is well also for the general practitioner to have one.

If there is infection upon a tooth it is usually very easy to determine, if the picture is perfect. Cases where one is unable to determine whether or not there is infection are exceptions rather than the rule. In chronic cases you might say there is always bone destruction, and in acute cases of one or two days' standing where the radiograph does not disclose a rarefied area, other conditions in the picture may possibly disclose the trouble, such as deep fillings, improper root-fillings, broken instruments in root-canals, etc., and in the very few cases where even this fails, the clinical observation at the chair with the radiograph used to eliminate possibilities, will disclose the trouble.

THE TEETH AS FOCI OF INFECTION.

I am very enthusiastic regarding the practical usefulness of the radiograph when used in the right way. I am thoroughly convinced of the fact that the teeth are the source of a great deal of systemic disturbances, and I think it is the duty of every dentist to regard the patient's general health as more essential than any restoration. I am fully aware that physicians are making a great many mistakes and sacrificing many useful teeth; but they are also doing a great deal of good, and there are many dentists who are making more fatal mistakes than the physician. The loss of the teeth cannot be compared with the loss of a life, although it has been said that it is easier to play golf with a wooden leg than to eat corn off the cob with false teeth.

We must not lose sight of the fact that apical infections of the teeth are not the only foci of infection in the

mouth. You will also find the periodontal infection, or pyorrhea alveolaris. There is very little doubt that pyorrhea causes systemic trouble, and is itself associated with systemic disorders.

We know also that the tonsils and glands are the seat of systemic disorders. Many times physicians overlook this and look with suspicion upon good teeth. We find many instances of swelling and infection in the region of the submaxillary gland. In most cases this condition is due to the teeth, and may come from either the upper or lower teeth.

Where patients are endeavoring to locate a focus of general infection, it is not enough in every case to simply make an ocular examination and give a positive statement that there is no trouble, as there are many cases where it is impossible to determine whether or not there is infection without a pulp tester or an X-ray in case the tooth is devitalized.

SYSTEMIC DISTURBANCES DUE TO INFECTED TEETH.

I do not believe many will dispute the statement that pain is not a reliable symptom of disease, as we find cases every day where there are very large areas of infection and absolutely no local pain. We also find cases where the mouth is full of infection and we fail to find that the patient has any symptoms of systemic or local trouble; but these cases are very rare, and show that the patient has a high resistance to this infection.

I will go so far as to say that in practically every case where I find apical infection in the mouth, I can say to the patient: "You have stiffness in the joints of the fingers, your arm goes to sleep, you have headaches, you are troubled with your eyes or ears, and have a general malaise feeling." I find this almost invariably to be the case. The most frequent sequel to infection is arthritis, but we find the results of this infection everywhere in the body—even in the mind. It seems queer at first thought but it is true that most

cases of systemic disorders seem to come from comparatively small radiolucent areas. This may be due to the fact that the most virulent of the pyogenes group of bacteria have a tendency to infiltrate to other parts, and those of less virulence tend to become localized.

In this connection I might cite a few of the many cases of this kind I have had referred to me. You have all seen hundreds of these cases, and no doubt you will find a great percentage of neuritis, headaches, ear and eye troubles due to the teeth. All of us have occasionally had cases somewhat different from the others. Most chronic diseases can be due to the teeth. I had one case, a perfect specimen of a healthy boy of fourteen. The doctor said he had tuberculosis, and he had night sweats, etc. I radiographed three or four teeth and they were extracted, and in three or four days the boy was all right.

I had another case of paralysis—facial paralysis, and within two days after the opening of several diseased teeth (the patient would not have them extracted) she regained her health.

I had another case very similar to that one, which had gone on for three years, and in but a day's time after the tooth was extracted the patient had thrown off that muscular paralysis.

Another very striking case was that of a man who had neuritis and could not move any part of his hand. Within a week after the tooth that had caused the trouble was taken out he was absolutely cured and had the use of his arm after he had been deprived of its use for six months.

I recall the case of a man who had been confined to his bed with paralysis of one side of his body. The doctor told him he was not coming back to see him until he had his affected teeth removed. I went to his home and examined his mouth. I had no X-rays; so I removed the worst-looking ones first; I took out six. I went back a week or so later and extracted six more. Within six months that man was back to work.

Another very interesting case is one

showing that oral infection is not the only source of trouble. An impacted molar was causing attacks similar to epileptic fits, two or three times a day. He had been that way for three years. I extracted the tooth, and from the minute it was out he went twenty-one days without an attack or any kind of trouble; then he had two or three attacks a day, and then he would go a week possibly without any. It was something like eight or ten weeks before he was entirely cured.

I shall now enumerate the uses of the radiograph, as illustrated by the lantern slides I will show you:

- (1) To determine if the mouth is the focus of infection producing systemic disturbances.
- (2) To determine if the teeth are the cause of reflex irritation, such as neuralgia, headaches, etc.
- (3) To determine whether there is apical or periodontal infection.
- (4) To follow the course of a fistulous tract.
- (5) Proving root-canal fillings and locating canals.
- (6) To determine whether or not there is a perforation.
- (7) To determine condition of teeth before filling and when contemplating a restoration.
- (8) To determine the extent of radiolucent area.
- (9) As an aid in extraction of impacted teeth or unerupted teeth.
- (10) As an aid in locating roots, fusion of roots, etc.
- (11) To determine whether permanent or deciduous teeth.
- (12) To determine the presence of permanent teeth.
- (13) To determine when to extract deciduous teeth.
- (14) To determine whether teeth are fully formed.
- (15) In the practice of orthodontia.
- (16) To show supernumerary teeth.
- (17) To show pulp stones or secondary deposits encroaching upon the pulp.
- (18) To show excrementosis.
- (19) Before and after apicoectomy, resection, etc.
- (20) To show fractures of bone.
- (21) To show fractures of teeth.
- (22) To show overhanging fillings.
- (23) To show ill-fitting crowns.
- (24) To locate hidden dental caries.
- (25) To show extent of periodontal bone destruction in pyorrhea alveolaris.
- (26) In diagnosis of pathological conditions of the maxillary sinus.
- (27) To locate foreign bodies.
- (28) To observe planted teeth.

I shall also undertake to point out a number of mistakes that can be made by misinterpretation of the pictures, as illustrated by the lantern slides I shall show you:

- (1) Mental foramen for abscess cavity.
- (2) Anterior palatine foramen for abscess cavity.
- (3) Nasal cavity for necrosis of palate.
- (4) Maxillary sinus for abscess cavity.
- (5) Inferior dental canal for a fistulous tract.
- (6) Mandibular foramen for osteoporosity.
- (7) To fail to bear in mind that there is such a thing as a normal periapical space.
- (8) To make a diagnosis of antral empyema because one antrum happens to be smaller than the other.
- (9) To make a diagnosis of antral empyema from small film held within the mouth.
- (10) Without taking into account the angle at which the X-rays were directed toward the tooth and film, to assume that a canal filling does not reach the apex of a root when it does do so.
- (11) Without taking into account the angle at which the X-rays were directed toward the tooth and film, to assume that the buccal roots of upper bicusps and molars are much shorter than the lingual roots of the same teeth.
- (12) To assume that a perforation through the side of a root does not exist because it cannot be seen to the mesial or distal.
- (13) To assume that a broach is following a canal because it cannot be seen extending too far to the mesial or distal.
- (14) To mistake a canal filling passing into a crooked root for a canal filling material passing through a perforation through the side of the root.
- (15) To state definitely from the appearance of flat radiographs that impacted teeth lie to the lingual or labial of the other teeth.
- (16) To mistake a small cervical filling for a pulp stone.
- (17) To assume that a filling in the crown of a tooth enters the pulp chamber when it does not.

(18) To assume from the appearance of flat radiographs that the root of an upper posterior tooth penetrates the antrum.

(19) To fail to take into account that an abscess cavity may lie to the lingual or labial of the adjoining teeth, giving the radiograph the appearance of their involvement but without involving them.

(20) To fail to consider the element of depth when judging the size of an abscess cavity.

(21) To mistake normal resorption of bone, due to age, for pyorrhea alveolaris.

(22) To fail to take into account the effect the tipping of a tooth to the lingual or facial will have on the appearance of the tooth in the radiograph.

921 FIFTEENTH ST., N. W.

[See also *Discussion*, as reported under "Proceedings of Societies," this issue.]

The Relative Value of Gold Foil as a Filling Material.

By J. AUSTIN FURFEY, D.M.D., Boston, Mass.

(Read before the annual meeting of the Maryland State Dental Association, Baltimore, June 12, 1919.)

MY object in presenting this paper is to strike home some of the fundamental facts of operative dentistry. The teeth are organs much used and abused by both patients and dentists. In no walk of life does individual honesty count more than in a profession. Our profession is especially blind to the laity. They do not know what is going on under their very noses.

Deacon Jones decided to speak his mind to the minister who was temporarily filling the pulpit. "I didn't like your prayer very much this morning," said he. "No?" answered the minister. "And what was the matter with it?" "Well, in the first place, it was too long; and also, aside from this, it contained two or three expressions which I thought were scarcely warranted." "I am sorry, deacon," the good man responded, "but it might be well to bear in mind that the prayer wasn't addressed to you."

Some of us have chosen the right profession, others from the very beginning have been handicapped by picking the loser from the start. Our profession has grown so extensively that few men are able to excel in all its branches, and

wise is the man who can recognize this fact. Many of us are limited in our field, measuring from the standard of perfection. In this paper I shall only try to touch upon the value of high-class operative technique.

We must approach cavity preparation and filling of every tooth as a surgeon does a major operation. To properly fill a tooth is neither a simple operation nor one to be treated lightly. If we do all work of this kind to the best of our ability, regardless of the time it takes, it means many hours saved later on in the patients' and operators' lives. With novocain—a blessing to the profession—there is no excuse in slacking cavity preparation. Novocain, to us, is what ether is to the surgeon. Our American way of living, producing the awful nerve conditions we see, was fast making the life of the conscientious operative dentist well-nigh unbearable. But, thanks to novocain, our field can now be made a painless one, and we can, like the surgeon, attend to our cavity preparations with the same thoroughness that characterizes their operative technique. I prefer novocain to gas-oxygen, as it al-

lows the patient to assist us in getting at our field of operation.

A patient well cared for from childhood should never have a pulpless tooth during its lifetime, and the day is fast approaching when the loss of a pulp will stand as a fatal error on the part of the dentist.

Prophylactic measures are invaluable in the care of the mouth, but in spite of these treatments cavities will form. It is upon the intelligent dealing with caries that the whole future dental comfort of the patient depends. My practice of twenty-four years embraces over a hundred children whom I have been responsible for as to their dental condition from birth. There is not one pulpless tooth in that big family. This has been accomplished by prophylactic care and frequent examination, but I feel that what is most responsible for this fact is the great care in operative technique. Every carious spot has been treated with all the intelligent skill that I could muster. The operations, whatever the material used, have been thoroughly well done. Naturally, there are many conditions to be met with other than caries, but I am confining myself in this paper to that one subject. Early caries is treated with a liberal use of silver nitrate, always applying it to fissures when they show the slightest tendency to decalcification. Up to the age of ten to fifteen, I always use plastic materials, preferably amalgam. Approximal areas in bicuspid and molars I open from the crown, smearing the cavity with silver nitrate, filling with amalgam, no attempt being made at radical preparation. After I have stopped the initial caries I can then take my time from the fifteenth to the twenty-first or twenty-fifth year, to properly block out these cavities, filling them with gold foil. It is in the bicuspid and first molars that we are called upon for most of our canal work. Intelligent watchfulness and high-class work will avoid root-canal treatment in these teeth. If the bicuspid and first molars are in good condition you will find the rest of the mouth satisfactory.

After many years of practice, with a summer practice of nineteen years at Bar Harbor, where I have had the opportunity of observing the work of many expert operators of fifty years back, I am of the opinion that gold foil is, as it always has been, the king of our filling materials.

THE GOLD FOIL FILLING VS. THE INLAY.

In my student days I asked Dr. Dwight Clapp what he used to fill teeth with, and he replied, "Brains!" We cannot exclude any recognized filling material from a well-balanced practice; they all have their uses. I consider the man who uses inlays in all cavities as far behind the times as the man who never set an inlay. The latest is not always the best. The inlay system is not a cure for all evils, and very many chickens are coming home to roost. The usefulness of the inlay, as well as gold foil, depends largely upon that ever-present "personal equation." Gold, whether in the form of an inlay or foil, is a detriment to the care of the mouth in the hands of a poor and shiftless operator. In the hands of the conscientious and skilful operator it is our best filling material today. A cavity prepared for foil or inlay must be well and skilfully done; that means time and energy spent. I deplore the abominable cutting for inlays that has swept the profession off its feet. Bear in mind, gentlemen, that whatever we replace tooth structure with is a mighty poor substitute, and for that reason we should be most conservative in destroying God's structure.

The advent of the inlay has made many operators overly enthusiastic on the subject, and teeth are suffering from the wholesale use of inlays, and the despised amalgam has been crowded out in instances in which the best judgment would warrant its use. We are going to suffer, as we always do, by placing the wrong kind of filling. If our inlay were a permanent affair there might be some excuse for extensive cutting to place this plug of carved gold. How do we know they are permanent? How many years

have we used them extensively? I have seen tragedies in my own practice that have never happened under my foil work. I am speaking only of high-grade inlay work; the poorest, goodness knows! is not even worth mentioning. A case came into my practice where the operator had, after preparing three cavities adjacent to each other, taken an impression of all the cavities at once, with the tray filled with compound, and set inlays made from this impression. This kind of work is more responsible for pulpless teeth and crowns than inherited poor teeth. Poor teeth and good dentistry is a far better combination than good teeth and poor dentistry. We see poor amalgam work, but teeth never suffer the way they do under poor inlays. We all know where the inlay is most liable to fail, the cervical margin, and that is the strongest point of a combination foil filling. We are told that inlays are time-savers. Are they? I have seen teeth cut to such an extent for inlays in young patients' mouths that makes the next step nothing but a crown. The extensive appearance of gold in a mouth is unesthetic, to say the least.

With me, inlays are almost barred in approximal cavities in bicuspid and molars in young patients. How absurd to send our children to the dentist once every two months, and then at the age of twenty have fillings the size of those of the poor day-laborer's child, who never consults a dentist unless driven to it by physical discomfort. Caries in bicuspid and molars frequently makes it necessary to use extensive cutting methods if inlays are to be used. And that is where the radical inlay worker fails. Is it artistic to have a young patient's mouth appear like a Coney Island at night? Is this good dentistry? If you have examined some of the pulp conditions under these inlays and have noted how the nerve and blood supply has been diminished, it will make you very careful if you have the full interest in the patient's future.

One of our highest aims in operative dentistry should be the conservation of tooth structure, and this cannot be ac-

complished by a radical use of inlays. We know that even a conservatively placed foil or amalgam filling will very often imperil the life of the cusps in molars and bicuspid from the age of forty on. We are obliged to have more than our margins covered and in perfect contact in an ideal filling. The filling material must be in close contact with the cavity walls at every point—and how many inlays fit in that manner? The cement fills up the spaces, a cement that is thinly mixed and porous, a pretty smelly affair.

The inlay, however, has worked wonders in the mouths of older patients, by obviating the extensive use of crowns. Also there is a line where the inlay begins and the foil filling ends. I remember a story Dr. Clapp used to tell, of an enthusiastic gold operator who kept a patient in the chair for five hours on a gold operation. The doctor said he did not know who was the bigger fool, the patient or the operator. One advantage in these extensive inlay restorations, as with the inlay in coronal cavities, is that you can put your magnifying glass on all margins and see what you have. This is impossible in many approximal cavities in molars and bicuspid with deep-seated and concealed cervical margins. The placing of inlays very often requires wedging, which is unnecessary in the majority of foil work.

I would like to speak here of a filling most useful in large restorations, and that is the Clapp filling, the combination of soft amalgam and cohesive foil. I had the good fortune to inherit many of Dr. Clapp's patients, and hundreds of these fillings placed twenty-five or thirty-five years ago are still doing magnificent work. This filling can be inserted in from one to one and a half hours. Another modification for deep-seated or irregular-shaped cervical margins, where the tooth has to be severely cut for inlay preparation, is filling up to the contact point with gold or tin foil, then completing the operation with an inlay. I have used this method for some years with good results to date.

[At this point Dr. FurfeY threw on

the screen some charts and teeth to illustrate his discourse.]

The manipulation of gold foil is fast becoming a lost art, especially in the East. This is most unfortunate, as no material in the hands of a skilful operator has done more to preserve tooth structure.

GOLD FOIL THE FILLING MATERIAL "PAR EXCELLENCE."

After a cavity has been properly prepared, our next consideration is the filling that will seal that cavity so that it will resist further invasions of moisture and bacteria, and restore the tooth as far as possible to its original condition. To my mind, gold foil is ahead of all our other filling materials. Granted that, even in the hands of a skilful operator, it takes more time to manipulate, it is a time-saver in the end. A tooth filled with this material will ordinarily last a lifetime. I have fillings galore in all kinds of mouths that have done service for over fifty years. In my own practice I have fillings to-day looking the same as they did when placed fifteen, twenty, and twenty-two years ago. We know what can be done with this material. Crowns and root-canal work are eliminated by proper fillings. Physicians are interested in diseases caused by the teeth. The sooner we open their eyes and prove to them that skilful operative work will prevent nine-tenths of all disease conditions, the nearer we will bring them to the right way of looking upon the dental profession. No profession has greater opportunities for benefits from prophylaxis than ours. God surrounded the dental pulp with a highly resistive material to protect it from disease, and it should be our highest aim to replace that structure, when penetrated, with fillings that will make the surface of the tooth continuous and resistive to further trouble. Dr. Black, who was never far wrong, recognized the importance of foil as a tooth-preserver.

Friends of mine say they have no time for foil work. I always have time to place work that will not have to be done again. It is a time-saver to the dentist

and patient in the end. Dr. Head, in his chapter on Fillings, says: "What could be more ridiculous than the present employment of the hammered gold filling for repairing a decayed spot in a tooth? It is a long, tedious, painful process to both the patient and the dentist. The most skilful operator has a decided percentage of non-bacteria-proof edges, and the average dentist seldom makes any bacteria-proof edges at all, so that the tooth filled with hammered gold ordinarily begins to decay as soon as the filling is inserted. Especially is this so if the filling is between the teeth, where the mastication of food will not sweep it clean and the bacterial plaques are allowed to grow upon it unmolested." These statements are too impossible to be worth discussing.

Along that line of reasoning we would have to throw out most of our filling materials, especially the inlay. Poor work is done with all kinds of material, but that does not necessarily disprove the value of the filling material. Results of materials employed in the hands of the expert are the best way to judge the efficiency of methods employed. One with proper technique should be able to fill any approximal bicuspid or molar cavity in from one to two hours. Patients in my practice who are not willing to spend this time may have any kind of filling they ask for. I generally try to make my cavity preparation and fill at a subsequent appointment if the filling is at all extensive, very often finishing the filling at another time if I consider it inadvisable to subject the patient to the whole operation at one appointment. In this way I am able to place gold in many so-called nervous patients' mouths.

After years of practice I still have all the enthusiasm for gold foil, my observations of past operations every day proving to me that foil is our most valuable filling material. I can say to a patient, "With care, this operation will last you a lifetime." The union of foil with tooth substance is so complete that sections of teeth filled will show actual penetration of the dental tubuli with gold particles. Can any adaptation be

better? If trouble ever occurs around these fillings it can be very easily treated by patching with foil or amalgam instead of removing the whole filling. The foil has been so well adapted that caries is as slow in penetrating the margin as it is the normal tooth structure.

Tin foil is invaluable at the cervical portions of bicuspid and molars, its adaptability is even greater than gold, and its non-conductivity is nearly equal to cement. I always place it at the cervical cavities where I am led to believe the pulp will be affected by thermal changes. It is very useful in filling coronal pits in deciduous teeth. It can be inserted and finished with burnishers in the time required to mix cement or amalgam.

In operating gold, care should be taken to regulate the blow of the mallet according to the force used in mastication. Many instances occur where teeth can be supported during the malleting. Frequently, I employ hand pressure where teeth do not withstand the mallet blow well. The use of the hand mallet and the passing of the gold by an assistant relieves one of a great deal of strain. After the cavity has been properly prepared, I very often smear the cervical margin with silver nitrate. After placing prepared cylinders of gold against the buccal and palatal walls, I sometimes use tin foil in the center; this material has some therapeutic value and adapts itself to the cavity walls even better than gold foil. After a sufficient number of cylinders have been placed, the whole mass is crowded down with a large pointed plugger, care being taken not to use too small a point, as it will break the fiber of the foil. The cylinders should not be packed too tightly, as they will bind and not go to place. After squaring off this surplus soft material I use DeTrey's gold to cover my soft foil and the floor of the step, following with as large a cylinder as the cavity will allow, malleting toward the margins and keeping the center depressed. The cervical portion is finished with gold-knife and strips, after which a separator is adjusted and

the contact point finished with thin strips. Stones and disks are used in finishing the coronal surface.

I always anneal my gold on picks in the open alcohol flame. Gold cannot be over-annealed; when it works stiffly you have melted it. The foil cylinders are made in the form of balls rolled loosely, with the ends turned in at the center. They can be more easily introduced into the cavity.

To my mind, one reason why so many operators do very little foil work is because of faulty technique. Their finished work of this kind has been so hard on them and the patient that for natural protection it has been given up. The results may have been perfect but attained with too much wear and tear. With a fair and appreciative patient, foil work is the easiest part of the day. Sitting on a stool and malleting, with my chair assistant passing the gold, I have a great deal of rest that I do not get in other operations.

Many expert operators of the past have been ruffians in their method. Some patients with teeth full of magnificent gold operations placed twenty or thirty years previous will speak with terror of the memory of those operations. This is where gold technicians have lamentably failed in the past. I always seek the patient's co-operation, and unless I can get that, and appreciation for my work, I am rather slow in my desire to place it, unless the operation is absolutely imperative.

I always impress on the patient that instead of placing a mere shining mass of metal, I have restored that tooth to a condition as near as possible to what it was when first it saw the light of day. An absolutely continuous surface which shows as such under a magnifying glass, a margin that the finest needle explorer will fail to detect, is what we want. In the face of our laborious root-canal work and the knowledge that almost every pulpless tooth of many years' standing is a menace to the general health, is this operation worth while? Is it out of date?

Years of high-class operative tech-

nique bring their own reward. The best is generally the most difficult to obtain. Years of this class of work in a practice make it possible for the dentist to always take new patients. Root-canal instruments are often untouched for weeks at a time; toothache is a rarity. Appointments can be made with precision, and the most appreciative patients are the oldest ones. I claim no superiority in operative ability or tech-

nique over the average operator; I only wish to show what careful consideration and conscientiousness can do in one of the noblest, most useful, and most humane professions.

Gentlemen, I thank you.

194 MARLBORO ST.

[See also *Discussion*, as reported under "Proceedings of Societies," this issue.]

Report on Dental Science and Literature for the Year 1918.

By E. G. SCHMITT, D.D.S., Springfield, Mo.

(Presented to the Missouri State Dental Association, at St. Louis, April 14, 1919.)

MR. PRESIDENT AND MEMBERS:

THE honor you bestowed upon me in appointing me to make a report on Dental Science and Literature for the year 1918 carries with it considerable responsibility, and in accepting it we have assumed an obligation to the society which we shall endeavor to fulfil to the best of our ability.

ROOT-CANAL TREATMENT.

In reviewing the literature of 1918 your committee begs to refer first to an article in the *Journal of the National Dental Association*, October 1918, page 1008, by Percy R. Howe, D.D.S., Boston, under the title "Treatment of Root-canals by the Silver Reduction Method." It describes in a concise manner some of the bacteria associated with dental caries as being highly aciduric, while others of the group are highly pleomorphic. Special stress is laid on the bacteria known as Goadby's *Bacillus necrodentalis*, the *Bacillus acidophilus*, and *Bacillus bifidus*. The plates and descriptions of these germs are entitled to special commendation, as well as the

plates showing sections of teeth after treatment by the "silver reduction method."

Your committee considers this method an advance in dental science and worthy of further consideration by the profession. It seems that it has few followers at present, but it is hoped that further research along this line will bring forth a standardization of root-canal treatment. The responsibility for dental caries is being charged to bacterial action more and more each day.

CYSTS OF THE DENTAL SYSTEM.

On page 555, *DENTAL COSMOS*, July 1918 issue, we find an article entitled "Cysts of the Dental System," by Kaethe W. Dewey, M.D., of Chicago. Our profession should be thankful for such a valuable contribution to dental science and literature. After the historical consideration of these cysts, together with their histologic structures, the writer proceeds to describe some features about which little is known. The statement is made that a cyst lined on the outer wall with epithelial cells is an extremely rare

occurrence. Under the head of "Vascular changes in dental cysts" we are given good descriptions of two cysts in the writer's collection.

After reading the article by Dr. Dewey, the attention of your committee was attracted to a contribution by Dr. Maurice Roy of Paris, France, on "The Nature of Pericemental Abscesses upon Vital Teeth." These two articles by Dr. Roy and Dr. Dewey have been studied by comparison, and the question raised in the mind of your committee is whether or not these abscesses are in reality dental cysts which have subsequently become infected.

Articles of the character above mentioned plainly demonstrate to your committee that more study along the lines of histology, pathology, and bacteriology by the profession at large is absolutely essential to enable us to accomplish the rational treatment of dental diseases. They completely demonstrate the intrinsic value of thorough knowledge of histology, bacteriology, and pathology as an important feature to the advancement of dental science, and that dental students should be made to realize that the shirking and mental neglect of these branches while at school will act as a handicap against them in their professional career. We can expect to advance in dental science only by being willing to study and become proficient in scientific branches.

ORAL SURGERY.

In the *Journal* of the N. D. A. for November 1918 there appears a communication on "Cleft Palate and Hare-lip," by Wm. Lete Shearer, M.D., D.D.S. Dr. Shearer embodies in his paper the histology and embryology, together with the etiology of cleft palate, both predisposing and exciting. He quotes Dr. Brophy, Dr. O. A. Strauss, Dr. Mall, Prof. Warnekros, the late Dr. C. F. W. Boedecker, and Dr. Chas. Mayo. In discussing the treatment of a complete cleft and either a single or double hare-lip, he says the operation consists of three steps, as follows:

No. 1. *Bone surgery*: If possible, within the first month.

No. 2. *Lip and nostril*: Six weeks after the bone operation, or earlier if the previous operation has been a success and the splints removed.

No. 3. *Soft-palate operation*: About the 14th to 16th month preferably.

After carefully reading this article, studying the plates, and reading the discussions by Dr. T. W. Brophy of Chicago, Dr. Chalmers J. Lyons of Ann Arbor, Mich., and Dr. Thos. L. Gilmer of Chicago, your committee begs to state that such a message serves to stimulate and encourage our profession along the right lines and tends to create an ambition for better oral surgery. It appears to your committee that we as a profession feel that in order to do major operations, such as cleft palate and hare-lip, it is necessary to have an M.D. degree. It is the opinion of your committee that it is the acquiring of knowledge and qualifications to carry out scientifically the technique in the performance of oral operations that makes the oral surgeon, and not the degree. Your committee further feels that these operations are purely within the field of dental surgery, and that the chair of oral surgery in our universities should be filled by a dental surgeon. We also feel that the Missouri State Dental Association should use its influence to bring about this desirable end.

An article of interest both to the general practitioner and the orthodontist is found in *Dental Items of Interest* for July 1918, page 6, by Dr. B. W. Weinberger of New York. His subject is, "Results Observed in a Further Study of Prenatal Causes of Dento-facial Deformities." The essayist's study of skulls from the embryonic to the adult stages is worthy of much praise, and beyond a doubt is of highly scientific value. He makes very interesting deductions and gives us some of the causes of these deformities.

Your committee desires to call special attention to the "dental trocar" devised by L. D. Coriell, D.D.S., of Baltimore, Md., and fully described at page 1154,

DENTAL COSMOS for December 1918. It consists of a small trephine driven by a dental engine in a right-angle hand-piece. Inclosed within the trephine is a twist drill that projects about 1 mm. beyond the tooth end of the trephine. After the trephine has been driven into the suspected area the drill is withdrawn, leaving the trephine in place. Then, with a platinum needle passed through the trephine, the culture is taken in the usual way.

This trocar, in the opinion of your committee, is the most practical device for the collection of pus from apical diseased areas, without contamination. It is both practical and scientific.

The article by Chas H. Oakman, D.D.S., M.D., setting forth "The Disastrous Results of Neglect of Oral Hygiene," fully illustrated, is a valuable addition to the science of dentistry. It clearly demonstrates the importance of prophylaxis. His lecture appears in the *National Dental Journal* for May 1918, at page 485.

FOCAL INFECTIONS.

The question of "Alveolar Abscesses and Diseased Root-ends" is one of the bugbears of the practice of dental surgery. Till of late we paid little attention to the fundamental pathological changes taking place in their formation. We took too much for granted. Microscopic study of these lesions is not only of great interest to the pathologist, but is of importance to the intelligent and successful treatment of the disease. An article by Kurt H. Thoma, D.M.D., of Boston, Mass., entitled "The Histological Pathology of Alveolar Abscesses and Diseased Root-ends," published in the DENTAL COSMOS, January 1918, page 13, is both scientific and of far-reaching importance. He makes the statement that alveolar abscesses caused by diseases of the dental pulp involve two distinct chains of pathological process. The so-called acute abscess represents a process of destruction, the tissue being dissolved into the pus, while the second is rather of a constructive nature,

producing inflammatory new growth in the cancellous parts of the bone. He describes acute abscesses and dental granulomata. The granulomata he classifies as follows, giving descriptions and illustrations:

- (1) Simple dental granulomata.
- (2) Epitheliated dental granulomata.
- (3) Dental granulomata showing necrosis and suppuration.
- (4) Dental granulomata showing cyst-formation, and
- (5) Dental granulomata showing various retrograde processes.

Dr. Thoma further describes the effects of alveolar abscesses on the root-ends, such as necrosis of the root-ends and hypercementosis.

Your committee feels, after reading an article of the character just referred to, that an admonition to those now in practice and those to follow is not amiss: Burn the midnight oil and give more time to the study of pathology.

In regard to focal infections and their relation to systemic disease, we desire to say that there is still more work to be done on this subject, and our recommendation to the profession is to follow this hypothesis to the very end, and establish facts not to be doubted by the most skeptical. We as a profession must convince the world that it is for us to say, from a scientific standpoint, whether a tooth shall be extracted or not. We can do this only by demonstrating to the allied professions our ability to diagnose such conditions. It is for us to lead and not to follow.

Under this heading our attention was attracted to a communication by E. C. Rosenow, M.D., on "The Pathogenesis of Focal Infections," *National Dental Journal* for February 1918. Dr. Rosenow calls attention to the streptococcus-pneumococcus group of micro-organisms showing changes in form, growth, and character under varying conditions and environments. He cites case after case showing the relationship of focal infection to systemic disease, such as acute appendicitis, ulcer of the stomach, recurring ulcer of the stomach, recurring neuralgia of the face and neck, etc., ac-

accompanied by experiments on animals in which various diseases have been produced by cultures made from oral foci of infection.

ORAL SEPSIS.

In connection with this subject, we would call attention to the article entitled "The Rôle of Sepsis and Antisepsis in Medicine," *DENTAL COSMOS*, July 1918, page 585, written by Wm. Hunter, M.D., of London. In his paper Dr. Hunter elaborates on "Principles of antiseptic surgery," "Sepsis in medicine—its apparent rôle—its actual rôle," "Oral sepsis," and "The clinical effects of sepsis." He then cites cases, and closes his communication with the "Principles of treatment."

The two papers last mentioned are especially recommended to the profession for further study.

PROSTHETIC DENTISTRY.

Under denture construction we must all admit that Dr. Dayton Dunbar Campbell of Kansas City, Mo., created quite a stir when he announced that "Measurements of the Mandible, Tracings of the Condyles, the Construction of Hypothetical Triangles, and the Use of the Face-bow are All Non-essential." His paper and the discussion can be found in the March 1918 issue of the *National Dental Journal*, and every dentist should study his work, as it is both scientific and practical.

EXTRACTION OF IMPACTED THIRD MOLARS.

The extraction of impacted third molars is given a great deal of thought in two papers of the past year. One of these is by Dr. Chalmers J. Lyon of Ann Arbor, Mich., on "Some Dental Anomalies and Their Treatment," in which he recommends the use of the chisel in the removal of impacted teeth. This paper can be found at page 790, August 1918, of the *National Dental Journal*.

In contrast to the foregoing paper, we would call attention to an article by

Dr. C. Edmund Kells of New Orleans, La., at page 101 of the *DENTAL COSMOS* for February 1918, on "Impacted Third Molars." Dr. Kells recommends the cutting away of parts of the tooth instead of chiseling away the bone. Both writers give reasons for their respective methods, and their articles are of great value.

APICOECTOMY.

Your committee found, while attending district dental meetings, a keen interest being manifested in regard to apicoectomy. A great deal has been written on this subject, still we wish to call attention to an article on page 255 of the *National Dental Journal* for March 1918. The subject of this communication is "The Status of Apicoectomy," by S. L. Silverman, D.D.S. He outlines five points of contention: First, whether to employ chisel or bur; second, sealing of the amputated end with amalgam or material carried through orifice of the wound; third, the amputation of the roots of tri-rooted teeth; fourth, the method of closing the wound; and fifth, the life of a resected root. The doctor gives the following reasons for advocating the chisel: First, a sharp chisel will accomplish all that the bur does, with consumption of less time; second, it will not clog or heat; third, there is no accumulation of debris; fourth, the chisel operation can be performed at home or in the hospital without dragging around a cumbersome foot-engine. He holds that the sealing of the amputated end with amalgam is unnecessary. He gives various reasons for saying that amputation of roots of superior molars is contra-indicated. He says that the use of strong medication in the wound is unnecessary. He advocates fine horsehair in suturing, using the interrupted stitch. If the wound is packed, he recommends changing the packing every forty-eight hours until the wound becomes so shallow as to be unable to retain the packing. The essayist shows a number of excellent plates in connection with his writing.

STERILIZATION OF TOOTH STRUCTURES.

In the *National Dental Journal* for March 1918 we find, at page 273, a paper by Matilda Moldenhauer, A.B., M.S., and Weston A. Price, M.S., D.D.S., on the "Relative Efficiency of Medicaments for Sterilization of Tooth Structures." We wish to call attention to nine points given under the head of "General summary and conclusions":

(1) Infected dentin and cementum are not readily sterilized by medication, even when the amount of medication is largely in excess of the mass of tooth structure.

(2) The medicament contained in a medicated root-dressing very readily and rapidly loses its disinfecting power, for the dressing itself becomes infected in a few hours even from the infected dentin and without being in contact with an infected solution.

(3) The medicament in the dressing dissipates more rapidly when one end of the dressing is in contact with an infected culture medium, such condition as obtains in a periapical infection.

(4) The efficiency of a root treatment is greater a few hours after it has been placed in the tooth than after several days' or even one day's time.

(5) All areas of cementum and dentin are difficult to sterilize, and as well tend to reinfection when the medicated root-dressing is left more than a few hours.

(6) The medicaments that are most efficient, namely, silver nitrate and formalin, are very objectionable, the former by its discoloration, and the latter by its destructive and irritating properties,

except when used very dilute and for a short time, and then quite efficiently.

(7) There is much encouragement in the use of chlorazene and dichloramin-T products. They are, however, exceedingly painful and destructive in over half of 1 per cent. strength.

(8) We now understand why it has been found that if a root treatment is left in the tooth for an extended period of time it becomes foul in odor, and we have also a verification of the observation previously reported by one of us, Dr. Price, to the effect that medicated root-dressings will always show bacterial growth after they have been left in infected teeth for a few days.

(9) These determinations indicate that an exceedingly small percentage of teeth that have been treated by members of the dental profession in the past have actually been sterilized. Nature is and has always been very tolerant, and much of the credit that has been taken by and given to the dental profession for the sterilization of infected roots has really been due to nature for her kindness in tolerating, at least without local irritation, a probably almost universal and permanent condition of infection, though in lessened amount when tooth structures have once been infected and subject to treatment.

It is very difficult for us to face the cold facts laid down to us by science, nevertheless, we must accept them, and it is our duty to keep on in our research work. We cannot and must not rest upon our oars; we must put more and more science and energy into our profession.

610 WOODRUFF BLDG.

Is the *Endamœba Buccalis* the Real Cause of Pyorrhea?

By EDWARD PERCY ROBINSON, M.D., New York, N. Y.

THE prodigality of nature, in the matter of reproduction of species or in their extermination, is in marked contrast to her economy in the laws which control all the phenomena of the life and death of species. We find no difference in the laws of nature applied to the animal and the vegetable kingdoms. Environment plays the same rôle in both. Certain species, be they animal or vegetable, will thrive or decline according as the environment is suitable or unsuitable. In other words, the laws of biology are applicable to all living things. The more we peep into nature the greater grows the impression that almost all things are equal, and that distinction exists between the living things only in the imagination of man. Indeed, such similarity does exist even in the highest form of animal life, which is man, to the lowest germ or parasite. The subject of this paper is the parasite known as the *Endamœba buccalis*.

In a work by Bass and Johns, entitled "Alveolo-dental Pyorrhea," there will be found, in a paragraph on page 81, the following:

Endamœba buccalis, the specific cause of pyorrhea, is not known to live and reproduce anywhere in the world except in the mouth and adjacent structures of man. It is "caught," either directly or indirectly, from another person who has pyorrhea, by putting more or less saliva and pus containing *endamœba* from the infected person's mouth into the mouth of one who becomes infected.

From this we assume that the etiology of *endamœba* is obscure, and an effort to trace its source of origin would necessarily take us back to the days of Adam and Eve; for it is claimed that this parasite does not exist anywhere in the world

except in the mouth and adjacent structures of man. Therefore it must have originated with the occupants of the garden of Eden, and been transmitted to the present generation. However, I do believe that these *endamœbæ* are accused of causing a disease of which they are innocent! That they live in the tissues of the mouth, and by preference in the gums and the sockets of the teeth, is quite evident—for the reason that they have been demonstrated and are capable of being seen under the microscope. But we must not forget that the cardinal principle of every bacterial infection depends on the nature of the tissue infected. If the soil is not suitable to germ life, infection will not take place. We must therefore first have conditions conducive to the growth and reproduction of germ life before the specific disease can be developed. This is self-evident from the fact that a firm, healthy gingiva is not the abode of *endamœbæ*, nor are they found there. If they be introduced through any of the channels possible they die, for without a natural habitat and proper sources of nourishment nothing lives.

The symptoms of pyorrhea alveolaris are familiar to all. Bleeding gums is probably the first symptom which the patient observes, and before we mention other manifestations it might be well to inquire into the cause of the bleeding. If we consider the fact that animals other than man are never afflicted with bleeding gums, or with pyorrhea for that matter, we are forced to attribute the chronic state of a congested gum as being due to a depraved condition; or, in other words, a condition in which the gum tissue is prone to inflammation.

The cardinal symptoms of acute inflammation are heat, redness, swelling, and pain. In pyorrhea all these symptoms, with the exception of heat, are present. The ulceration or breaking down of the tissues of the gum is characteristic of inflammation in its chronic form. It is therefore not surprising that in pyorrhea the gingival margin disappears; nor is it very long after this that the periodontal membrane is absorbed, with the resulting loss of the tooth.

At what time in the course of the disease are we to conjecture that the endamœba makes its appearance? The endamœba is a symbion, and selects the streptococcus and other pus-forming germs as its associates. The streptococcus is probably the most abundant. The food of the endamœba is the pus and detritus of ulcerated gum tissue. It is reasonable to assume, then, that this parasite would not invade a territory which did not possess suitable nourishment for its existence. And should it by accident find itself on a healthy site of the mouth or gum it could not of itself produce sufficient ulceration of the tissues on which it might feed, before death overtook it. For according to the law of life we must eat to live, and the endamœba is not an exception to this universal law. Therefore it follows that ulceration must have been present before the endamœba arrived on the field. And likewise must it be conceded that the pus in and on which it is to live had been prepared by the streptococcus previous to the arrival of the endamœba, for the reason that the latter does not live alone.

We are forced, then, to the following conclusions: That inflammation of the gum appears first, the tissue breaks down in a given point, the streptococcus arrives on the scene, and the last comer is the endamœba; for it is contrary to reason to place the endamœba in a sequence having any other relation. If this be granted, we can be permitted to eliminate both the streptococcus and the endamœba as being the cause of pyorrhea, and confine the subject entirely to the cause of the inflammation: for we must

logically conclude that if inflammation had not been first present in the gum tissue, neither of the two bacteria would have found means of subsistence, and could not have survived; because it is a recognized fact that perfectly healthy tissue, whose power of resistance is unimpaired, cannot be infected by bacteria, and that inflammation must previously exist in the tissue involved before any variety of bacteria can find lodgment; and it must be further admitted that no one has ever seen a bacterial infection in which inflammation was absent. We have bacteria of all types in our bodies, but they remain dormant until the tissue takes on a condition suitable for their growth and multiplication; and it is most probable that Virchow's belief that bacteria are but scavengers and are not the real cause of the disease is worthy of credence.

PROBABLE ETIOLOGY OF PYORRHEA.

Inflammation, whether it be of the gum tissue or of any other part of the body is developed from etiological factors identical in character. Inflammations following traumatism, bacterial invasion, or the presence of chemical substances in the tissues, behave exactly the same irrespective of the location involved. Probably the most universal factor in causing inflammation is a condition of acidosis. This dyscrasia cannot be considered as being confined to the secretions of the mouth, for it can be assumed that if it exists at all it exists everywhere in the body. And if we find an acidosis following any pathological state, we are sure to find acidity in the mouth. It is useless to attempt to rid the mouth of acidity by alkaline agents while the cause exists. The true therapeutic measure lies in removing the cause.

Nature is ever striving to neutralize acidity, and this is frequently accomplished at the expense of the basic elements of the body, such as ammonium, calcium, iron, magnesium, etc. One of the many sources by which acid enters the body is through the ingestion of sodium chlorid (table salt). In solution

this salt is split up into sodium and chlorine, the sodium being oxidized and the chlorine going to form the gastric juice. The harmful practice of using salt to excess with food so increases the acid content of the body that, for metabolism to be properly carried on, a too great demand is made upon the basic elements of the tissue in order to maintain a stable neutral condition. In other words, the acid medium taken in is greater than the content of the alkaline elements of the tissues can handle, hence acidity is inevitable. Might not acidity, by extracting the basic elements from the tooth structure, be the cause of dental caries? This query is also applicable to other acid combinations found in the saliva, and in the *DENTAL COSMOS* for May 1919 we find an able editorial dealing with this subject.

NEUTRALIZING THE ACID CONDITION OF THE TISSUES.

However, it is estimated that the amount of sodium chlorid in the human body averages 200 grams. This is not a normal amount, but exists because of the enormous quantity of salt ingested every day. If we combined all of the alkaline basic elements in the body we would not have sufficient to neutralize the excess of chlorine furnished by the sodium chlorid ingested. The amount of alkaline salts found in the vegetable food eaten is not sufficient even to counteract the excess of the chlorid. The remedy lies in reducing the sodium chlorid.

There is a striking resemblance between the gums in scurvy and the gums in pyorrhea. In scurvy the condition is brought about by a lack of green vegetables containing basic elements, such as potassium, etc., and indeed, also to the free use of salt. When the proper food is eaten, scurvy disappears. Pyorrhea might be looked upon as a chronic form of scurvy. However, after a person has been eating salt for forty years or more a chemical change takes place in the cell tissue of the body. Physiologists believe that of the two elements, sodium and potassium, the former is found to greater extent in the fluids of the body, while

the potassium element properly belongs to the cell structure. These two substances displace each other. For example, when the threshold value of sodium is exceeded, the potassium is displaced, and the sodium, not being tolerated by the cell, acts as an irritant, and this irritation is the first step in setting up inflammation.

The best salt of potassium to bring about a neutral condition of the tissues is potassium nitrate. The chemical reaction takes place in the following manner: When potassium nitrate, composed of potash and nitric acid ions, enters the plasma of the blood, which always contains sodium chlorid, it is possible for a double decomposition to take place, by which potassium chlorid and sodium nitrate are formed. Now it so happens that the heat of formation of potassium chlorid is higher than that of sodium chlorid, consequently, according to the established principles of thermo-chemistry (which teaches that the particular chemical compound will be formed first whose so-called "heat of chemical formation" is highest), not only will there be a tendency to the formation of potassium chlorid, but this salt will be a more stable constituent of the blood or of any of the fluids or tissues of the body than chlorid of sodium.

At the same time as potassium chlorid is formed by the union of potassium ions with the chlorid ions of the chlorid of sodium present in the fluids of the body, the nitric acid ions, released from the potassium nitrate, will combine with the sodium ions of the sodium chlorid, forming sodium nitrate. This substance can pass out of the cell tissue into the blood and take part in other chemical reactions in which nitrogen plays an essential part, as the urates for example.

The adoption of the roentgen rays as a diagnostic means in dental practice has revealed some very striking and hidden pathological conditions. Until these rays were used it was not suspected that an apparently perfect tooth could be afflicted with an abscessed root. And this very appearance of health and disease existing in the same structure gives rise to the query as to the cause of the phe-

nomenon. The explanation does not seem far from a logical solution; for, as has been stated, nature is ever seeking to neutralize acidity and will do so at the expense of basic elements of the tissues.

Now, it is quite evident that the chief basic element of the tooth is lime. The tooth structure was no doubt created to withstand a certain degree of acidity, but when the secretions of the mouth become hyperacid, it is to be expected that the action of an acid on lime, or a salt of lime, will result in a chemical reaction, the acid becoming neutral at the expense of the lime of the tooth. That this condition occurs with marked frequency, and by preference at the root, might be accounted for by the fact that the root structure is vascular, to a degree, while the upper portion of the tooth, the crown, is not supplied with blood, and consequently the vascularized tissue is more susceptible to ulceration than structural tissue not so nourished. Therefore, it might be inferred that ulceration at the root of the tooth is analogous to dental caries of the crown or body of the tooth.

The remedy, therefore, for ulcerations of the root structure, dental caries, and pyorrhea is prevention; and by prevention is meant the removal of the acidity of the tissues of the body. This can be successfully accomplished by the administration of $\frac{1}{25}$ grain of potassium nitrate in four ounces of water. The prescription would read: "Potassium nitrate gr. v, aqua 1 oz. *Sig.* Four drops in four ounces of water every four hours." This salt is found in all vegetable matter, and for that reason is an ingredient of food materials, therefore its administration, in the minute dose recommended, is quite harmless, and can be given to the patient for months without fear of untoward symptoms. In addition to the internal use of this salt, a mouthwash of a 1 per cent. solution of this same salt should be prescribed, to be used two or three times a day, and after the teeth have been brushed, but not to be swallowed.

OTHER AFFECTIONS DUE TO ACIDOSIS.

Manifestations of acidosis may be found in the general economy other than in pathological changes in the gum tissues and the tooth structure. In the *Medical Council* for May 1919 the writer gave reasons to show that nephritis was engendered by a condition of hyperacidity, demonstrated by a very high percentage of the chlorids in the urine; and that inflammation of the parenchyma of the kidneys was the result of the hyperacidity and also the cause of the disease. In the *Medical Record* of May 4, 1918, the writer, in an article on the use of potassium nitrate in cancer, also drew attention to the probability of cancer being caused by an excessive use of salt. The evidence brought forward on this theory in a previous article in the *Medical Record*, September 1, 1917, entitled "An Hypothesis on the Physico-chemical Nature of Cancer," still remains undisputed, and no controversy on the subject has as yet appeared.

From the pathological conditions seen in pyorrhea, in nephritis, and in cancer, the analogy is so close that the question arises whether these distinct diseases are nothing more than manifestations of one and the same thing, namely acidosis of the general system. However, it certainly seems more than a coincidence that these diseases appear about the same period of life, that is in middle life, and, as regards pyorrhea and cancer, never in youth. Attention might be drawn to the fact that in both nephritis and in cancer, inflamed, spongy, or bleeding gums will invariably be noted to exist as a concomitant or forerunner of either of the diseases. Most certainly, should either of these diseases exist, the patient will undoubtedly exhibit a pathological condition of the gingiva—from a mild redness of the gums to an advanced condition of pyorrhea with destruction of the tissue.

Post-operative Pain Control.

By A. E. CASE, D.D.S., Holton, Kans.

THE question of post-operative pain control has been discussed as little as any subject I know of in dentistry, yet we have it to deal with in all our surgical procedures, and it is without doubt as important as the elimination of pain during our operations. Our present-day methods in the administration of nitrous oxid and oxygen and conduction anesthesia have practically solved the latter problem, and many very helpful suggestions have been offered to assist in controlling post-operative pain. Winter's "Exodontia" offers excellent procedures, such as removing dense clots, removing fractured process spicules, pressure on sockets to replace fractured process and relieving dilated sockets, washing the sockets with warm sterile saline solution to freshen the area and allow new clots to be formed. These and many other procedures to be watched at the time of operation, lessen post-operative pain. Many drugs to be used locally, as suggested by Prinz and Buckley, and many others, have been recommended. Some have proven very good, but as a whole they do not do their work as thoroughly as our patients expect, considering our present methods of eliminating operative pain. The use of euroform paste, packing the sockets with powdered novocain and gauze, the use of lysol, phenol, campho-phénique, and hundreds of other local analgesic and anodyne remedies, all assist in lessening but do not control the post-operative pain.

The use of narcotics and hypnotic drugs, such as morphin, opium, and codein, are rather to be avoided by the dentist. The average dentist avoids

prescription writing; why, I do not know.

There seems to be a general feeling among the laity, in cases where nerve blocking or infiltration anesthesia is used, that the method of administration of the anesthetic causes the post-operative pain, and generally no amount of suggestion or explanation completely dispels this idea. (When a tooth is extracted, the general thought is that trouble and pain are gone forever.)

With these facts in mind, and having had some twelve years' experience in pharmacy, I have been experimenting with various drugs, endeavoring to secure a combination that, acting synergistically, would have no pronounced action on the heart, respiration, etc., and yet would prove to have a strong controlling influence on the sensory nerves and nerve endings. The formula which I present I have sent to over one hundred dentists to be tested for a time, and the reports I received prompt me to suggest its use in every case where post-operative pain is anticipated; and I can assure everyone that if reasonable common-sense is used, great benefits will be derived from it. In all cases of minor oral surgery—extractions, apicoectomy, full or partial excision of the alveolar process, bone curetments, severe inflammatory cases, soreness from gingivitis, osteomyelitis, etc., these capsules will do better work than morphin and codein and their like, and the ill effects noted from these narcotic drugs will be absent. Children and adults in almost any stage of infirmity or health may be given this formula with the later suggested dosage. The amount of caffen should be regu-

lated from one-half to three grains. The phenacetin and acid aceto-salicylic should be reduced for children according to age.

For general use as a medium dose, I suggest the following prescription:

R—Caffein citrate, 2 grains,
 Phenacetin,
 Acid aceto-salicylic, aa 3 " . M.
 Fiat cap. no. j. Disp. no. iv to xx (as
 needed for case duration).

Sig. One at once, follow 1 every 2 hrs.

Phenacetin, a white crystalline powder, odorless and tasteless, is used to secure antipyretic and anodyne effect, and in this combination the anodyne properties are enhanced 50 per cent. Acid aceto-salicylic, or commonly known as aspirin, with the caffein and phenacetin, becomes almost narcotic in its action on the sensory nerves. Caffein citrate might be called a light narcotic, and its synergistic action with the other two

make the combination ideal for the purpose desired.

Several pharmaceutical houses are preparing to market this formula now in tablet form, and I believe they will come into general use by the dentist for this purpose. I prescribe four capsules and up in every case of extraction, or any surgical procedure, and can state, as did the one hundred or more reports, that surprising results have been obtained.

Whenever possible, one or two capsules given to patient one-half hour before operation assists very greatly, as action from the remedy has a chance to begin before the anesthetic wears off. I urge all to give the formula a trial and pass the word along, as I feel that the post-operative pain control question can be handled far better by employing this internal treatment in conjunction with our present operative precautions and the use of local treatment immediately after operating.

CORRESPONDENCE

A Case from Practice.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—The following unusual case may be of interest to the readers of the COSMOS.

Case of A—, water tender, U.S.N. The patient presented with slight recession of gum tissues, at and about the right superior central incisor. There was a slight flow of pus on application of pressure. A discoloration about half-way up

and beneath the gum was noticed, no pain, however, being experienced. Incision was made and a hair nearly one-quarter of an inch long was removed. Within a week the normal condition was restored.

CARLTON B. MORSE,
Lieut. D.C., U.S.N.

PORTSMOUTH, N. H.

PROCEEDINGS OF SOCIETIES

Dental Society of the State of New York.

Fifty-first Annual Meeting, held at Syracuse, N. Y., June 12, 13, and 14, 1919.

(Continued from page 882.)

THURSDAY—*Afternoon Session.*

THE meeting was called to order by the president, Dr. Beach, at 2 o'clock.

Dr. PAUL R. STILLMAN, New York, read the report of the Committee on Practice.

[This report is printed in full at page 947 of the present issue of the DENTAL COSMOS.]

DISCUSSION.

Dr. Robert Murray, Buffalo. *Mr. President and members of the New York State Dental Society*.—The report of the Committee on Practice for the year 1919 is interesting by comparison with the reports of former years.

The by-laws of the society provide that a Committee on Practice shall, during each year, examine any improvements or novelties in the practice of dentistry, or any new dental appliances or apparatus which may be brought to their notice, or which they can discover, and make report upon the same to the society at each annual meeting, endeavoring also in conjunction with the Committee on Arrangements to procure clinical exhibitions, so far as possible or advisable, of the subjects of their report at the same meeting.

A careful perusal of this year's report fails to find any mention of new apparatus or appliances or novelties perfected during the past year. No new agents for the cure of disease or new discoveries

in the treatment of disease—in a word, the report treats of methods rather than materials, of prevention rather than cure. It is the expression of the latest thought and tendencies of modern dental science, and places emphasis upon preventive rather than mechanical dentistry. This change from the old-established methods to the newer and scientific methods has, like all other great achievements and progress, been necessarily slow and gradual, and is the result of scientific discovery and research covering a considerable length of time.

The oral hygiene propaganda which has been sounding in one's ears for the last fifteen years is the echo of the scientific axiom that a clean oral cavity is necessary to sound bodily health; hence the necessity for continuing this important branch of our society's activities, especially in the schools.

A greater responsibility, however, rests upon the profession with reference to our scientific research work. Substantial progress has been made by placing this important work under the supervision of the National Dental Association, and the distribution of the financial burden upon all its members, rather than upon a few willing contributors.

If I may be pardoned for injecting a remark that is not germane to the report under discussion, I would venture the suggestion and the hope that I may live to see the day when the dental profession as a whole, and not merely the

members of organized dentistry, shall be compelled to contribute to this important work, the benefits of which are shared by members and non-members alike.

If laws can be enacted compelling the entire profession to register annually and thus contribute to a fund to combat destructive forces that are a menace to the health of the public, I do not see why that assessment could not be increased, and a proportionate amount devoted to constructive effort to solve some of the intricate problems that have a direct bearing upon the health of the community. Other states are following the example of New York State in the matter of annual registration, and it is to be hoped that some time in the near future the states of the entire Union will adopt similar laws, with a registration fee sufficiently large not only to defray the expense of cleaning the sewers of the dental profession, but of beautifying its landscape.

Focal infection. The profession seems to be divided into two factions upon this question—the conservatives and the radicals. It is interesting to note that some of our ablest scientific men, who are devoting much time and study to this important subject, are as divided in their opinions as the average practitioner. Personally I have no remarkable cures to report, such as we read and hear about nearly every day, but on the contrary I have quite a number of dissatisfied patients who have submitted to wholesale extractions upon the advice of physicians in an endeavor to get rid of some systemic disease, but without effect. I am of the opinion that this question, like many others that have convulsed the two professions in years past, will be satisfactorily settled in due course of time.

In this connection, I wish to quote a paragraph from a paper entitled "To What Degree are Oral Pathological Conditions Responsible for Systemic Disease?"* read before the fiftieth anniversary

meeting of the Pennsylvania State Dental Society, at Wilkes-Barre in April of last year, by Dr. Percy R. Howe of the Forsyth Research Laboratory:

A "focus of infection" is a localized pathological area in which bacteria are to be found. Here goes on the conflict between the bacteria, their morbid products, and the host. Here the process is centralized, and if the forces of immunity are unimpaired, the bacteria, if not actually destroyed, are walled off from the rest of the human system; and more, the individual attains a high and a specific immunity against this specific morbid process. Bacteria are not discharged freely into the circulation to wander about at will and to settle without rhyme or reason at any point they may choose. Once they enter the blood they are shortly disposed of by all the forces of immunity. Should they be introduced into the circulation not in small numbers, but in large numbers and in increasing doses, what happens? A high degree of immunity is obtained. This is the very method employed to obtain immune sera. The exponents of the focus theory ignore this. Is all the work upon immunology to be here thrown aside?

The principle of the bacterial distribution from a focus is to be likened to the exposure of the vaccinated person to smallpox, to the person inoculated against typhoid to typhoid, to the person inoculated against tetanus to tetanus infection, and so on. These persons are immune to the specific flora. Persons are to a great degree immune to their individual alimentary flora. What is there about a so-called granuloma that indicates bacterial diffusion? It is a walled-off, circumscribed area, a thickened sac of fibrous tissue. It may contain a few non-virulent streptococci, but so does the healthy mouth. Its histology shows that it undergoes fatty degeneration, and it frequently calcifies. It is a minor and harmless thing.

The oral hygienist. Some twenty years ago Dr. Frank W. Low of Buffalo had a vision which he embodied in a paper read before one of our local societies in Buffalo. The title of the paper was "The Odontocure," and the essayist predicted that the operation of oral prophylaxis in the future would be performed by one who had special training in this class of work. I do not know where my friend Dr. Low got his inspiration, but, gentlemen, the "odontocure" is

* See DENTAL COSMOS for January 1919, vol. lxi, page 33.

here, and I believe has come to stay, as she is vouched for by this society and has the government seal upon her. The necessities of the situation demand her presence. An oral hygiene propaganda extending over a considerable number of years has created a condition that can be met in no other way. The broad application of the underlying principles of oral prophylaxis has opened up a wide field and placed new responsibilities upon the profession, and the dentist who ignores their relative importance in his daily practice has not a proper conception of this important branch of dentistry.

The essayist's report of the twenty-eight cases treated by a New York dentist and their subsequent escape from the influenza epidemic I do not consider a mere coincidence. We have further testimony in the opinion expressed by Dr. Pierre Robin before the French Academy of Medicine (see March issue of *Clinical Medicine*) that a well-executed oral hygiene made it possible to prevent complications in cases of grip, and also to avoid endangering others by contact.

Traumatic occlusion. One of the most important questions brought to our attention by the essayist is the subject of traumatic occlusion. The dentist who devotes his energies wholly to the performance of the operation for which the patient presents, without making a careful survey of the oral cavity, has not performed his full duty. There are so many danger signals present in the average mouth that it requires constant practice to properly diagnose and correct the many abnormal conditions that sooner or later invite disaster.

The abraded cusp, the bright spot on a filling, the receding gum, the purple appearance of the gum tissue around a certain tooth, the deep pocket on the side of a certain root that moves in its socket every time the patient closes the teeth, these and many other symptoms call for immediate relief, and the dentist who has not trained himself to diagnose these conditions has not a proper conception of preventive dentistry.

In conclusion, I wish to congratulate the essayist for the able manner in which he has presented his subject for our consideration.

The new era in our profession means new responsibilities. The question that arises is, Shall we be able to meet them?

The manner in which the profession responded in the great world crisis is ample evidence that it will be equal to any demands made upon it in the future.

The cordial relationship existing between medicine and dentistry, which has been stimulated by the wonderful team work in the cause of suffering humanity at home and abroad, has so impressed the world that it is not surprising that the federal government has seen fit to remove the stigma that has so long been a cause of humiliation to the profession by giving the dentist almost equal rank with the physician in the service.

Dr. L. S. Goble, Rochester. I think I must be going about with a chip on my shoulder, as I took quite a violent mental attitude to the sentiments expressed in Dr. Stillman's paper, but after reading it several times with more open-mindedness, I found in it a very clear exposition of many subjects upon which the profession has been lax both in theory and practice.

I think it is because Dr. Stillman classifies as reactionary such dentists as do not believe in dental nurses and oral prophylaxis, as it is generally taught and practiced, that stirred my opposition, and I cannot understand how a reasoning man can believe either is good for the public at large. He says, get a young graduate to fill roots, etc., and you do oral prophylaxis as preventive dentistry. Undoubtedly it will be money in your pocket to do as Dr. Stillman suggests. You can even have two or three dental nurses and let them do the work, as some dentists are doing.

I had the whole question quite vividly presented to me when we first used stain to show plaques. The suggestion was that we could have our patients come once or twice a month, and show plaques and give the patient prophylactic treatment. I suggested to the dentist that

we have them come every two days, as they would show plaques and we could make more.

Dr. Stillman's contention that it would be for the benefit of the dentist, the graduate, and the public, is partially true; in fact, two-thirds true—to the dentist and the assistant; I have never seen a patient that had frequent so-called prophylaxis that had not been injured. Oral cleanliness is not obtained by dental office manipulations, but by daily personal application along common-sense lines, which is the direct opposite of prophylaxis as taught and practiced by the state at large.

I wish to state here that I have been treating oral conditions for over thirty years, the late Dr. Hofheinz, Dr. Requa, and Dr. French sending me pyorrhea patients over twenty-five years ago. I was one of the first, if not the first dentist in Rochester to use a porte-polisher. So I am not a novice in the field. Besides, I am convinced that I have done more experimental work along this line than any other ten men in the state;—and I verily believe that within twenty years we shall have an epidemic of so-called gum recession, which will be nothing more than the logical sequence of our present oral prophylactic propaganda. A few years ago some dentist noticed that people having wide spaces between their teeth had cleaner teeth, and not many cavities. So what did the profession do but advocate filing between all teeth that touched, so that they would be easily cleaned and rinsed. You would hold up your hands in holy horror at such idiotic proceedings now. You would say it is contrary to nature and common sense. Yes, but what are you doing?

The interstitial space and the gingiva are necessary both for comfort and cleanliness of the patient. Touch the normal gingiva with the finger-nail, and you will find it very tender. We eat toast and hard food and tough beef, and still it is tender, which shows that it is natural for it to be tender. Let us look for the reason. The crown of the tooth was made bulging and the neck of the tooth

constricted, so that food in masticating is forced out at an angle from the gingiva—and the harder the food the greater the angle. Baked bananas and mashed potatoes might rub against the gingiva, but nothing harder. But what do your trained nurses and your prophylaxis cranks do but teach the polishing of the interstitial spaces with strips and the scrubbing of the gums daily with brush and rubber finger! What is the result? The gums under the persistent treatment recede and recede, until the patient is told that nothing can be done for him, as he has very bad receding gums. This reminds one of a nose specialist, who thought that he could improve nature and let the man breathe always through his nose, and so took out the turbinated bones. Oh, yes! it is true the man could always breathe through his nose, but he had a distressingly dry throat as long as he lived.

In the long run, the man with interstitial and gingival gum tissue will be cleaner and healthier, though he has fillings in every tooth, than the devotee of any system that gives him large interstitial spaces.

But do not the gums need massaging? No. In the majority of cases the dental tissues get too much to do, and anyone that does such pyorrhea work knows that by relieving the stress on a tooth or even destroying the nerve and cutting off the blood supply from that tooth or teeth, improvement follows immediately.

Dr. Stillman speaks of a dentist with twenty-eight monthly prophylactic patients. A dentist with a large practice might have that many. Less than 3 per cent. of my patients need it monthly, 15 per cent. quarterly, 50 per cent. at yearly and 25 per cent. at longer intervals or not at all. Depending on monthly prophylaxis for cleanliness would be like having your house fumigated monthly, and never cleaning the refrigerator or boiling the dishcloths.

Brush the teeth crosswise with a brush with three rows of bristles, with shorter bristles at the point of the brush. Place the teeth edge-to-edge, and brush hard against the occlusal line. If you

touch the gums, open the teeth a trifle, until you do not touch the gums. The bristle moves faster than the hand, and the side of the bristle will curve around the tooth and down between the teeth without injuring the gingiva or irritating it. Cleanse the inner parts with the same idea of not irritating the tissues, and you will have no need of monthly prophylaxis.

Dr. Stillman says we should prevent bad oral conditions by early correct diagnosis. The field is a large one, and needs scientific treatment. The average dentist is incompetent.

Dr. Dunning, who has charge of the Oral Hospital in New York, told me that every day patients came with mouth conditions that neither he nor anyone he was associated with knew anything about. Very many of them are reflex systemic conditions. For this reason dentists should be the best diagnosticians in the world. I frequently make diagnoses and send the patient to a physician before the disorder is outwardly manifested or the patient is aware of trouble.

We now come to the subject of *traumatic occlusion*. Not more than one in twenty-five seems to know anything about it, and not over one in fifty tries to correct it. The greatest oral source of pyorrhea, of discomfort, and of bad facial contour and bad dental habits, is traumatic occlusion. Yet a large number of dentists are in need of correction of the condition in their own mouths without being aware of it, and never leave the teeth of patients that call upon them for dental services.

I lately leveled and smoothed the teeth of a man whose teeth were as rough as a rip-saw, and on occlusal lines like the skyline of New York City. After two hours of grinding and polishing, he remarked, "My! but my mouth feels fine! It has been a constant source of irritation to me for five years!" This patient had been to his dentist twice a year for twelve years, without fail. Now, his dentist is well known all over the United States as a fine workman and a great scholar, and second to none in America.

Yet he evidently knew nothing about traumatic occlusion.

Study your patients. Study their occlusion and their bad occlusal habits, and you will be surprised. Dr. Stillman does not make it too strong. Hardly one in a thousand has perfect occlusion, and while the orthodontist can do a great deal, most malocclusion is from habit and is chronologically progressive. A crowding third molar may cause the second molar to turn just enough to cause the strain on some cusp, and set up irritation enough to throw the whole dental apparatus out of alignment. This can be easily remedied, but if neglected for years causes irreparable loss and discomfort. But we get our minds so full of violet rays and ipecac, ionization, vaccines, and other fads that we have little room for common sense. You see men every day whose mouths are freaks, and yet they go to high-grade and high-priced dentists.

Dr. Stillman, in calling attention to this subject in such a clear and concise manner, has done the dental profession a great service.

Dr. Samuel A. Demarest, Glens Falls. The report of the Committee on Practice which we have just heard is an excellent one. It is full of interest, well composed, and based upon some of the highest ideals in dentistry; but I think you will agree that it is a most unusual one as well. The field covered has been handled in an able and characteristic manner, but recognition has not been given many of the departments of dentistry ordinarily expected of a report on Practice. The average practitioner is confronted by many perplexing problems, and he naturally looks to the experience and knowledge of others for guidance in his methods and their application. The report on Practice has become a sort of clearing-house of opinions from which to make deductions, and I therefore wish to criticize the one this year as being incomplete, rather than lacking in inspiration or value. Surely the ideal aimed at is a lofty one, but we cannot all practice periodontia or ortho-

dontia exclusively. So it is to be hoped there will be brought out in the general discussion many points which the report has failed to consider.

The association which the profession had with war activities, as stated in the preamble, is timely and worthy of our praise. This was without doubt the most just recognition and indorsement the profession has ever been given. The point is well taken, however, that we should not allow our gratification to overbalance the facts. It is true that dentists ranked equally with physicians in the army and navy, and profited greatly by the relationship. That recognition of dental services rendered to the men before and after enlistment was gratifying; but, after all, we have our own destiny to work out, and must not permit our heads to be turned by the experience of the past two years.

The part devoted to "diagnosis of focal infection," with its reference to the so-called "X-ray quack," is both timely and to the point. I can think of no more irritating reflection on one's professional dignity than to be called upon to administer treatment in a given case for the relief of certain disorders that have been officially "arrow-marked" on a pack of X-ray negatives by some self-styled roentgenological expert.

In most published case reports of focal infection arising from a dental source the usual treatment prescribed has been extraction. There is much radiographic evidence tending to show that teeth with septic root contents may be sterilized by the silver reduction method, and that the rarefied areas will subsequently be filled in. Dr. Percy R. Howe by this method makes it possible to sterilize septic dental tissue, and to retain the teeth. It is a precept in surgery that any septic or necrosed tissue must be removed, and drainage established. And it is indeed an epoch-making procedure for dentists to presume to violate this precept and attempt to sterilize a septic tooth-root while it is yet within the confines of the body. I have myself successfully employed the Howe method in many cases which I would until recently have be-

lieved to have been hopeless, except possibly by the introduction of medicaments into the rarefied areas by ionization. The following case history is significant:

Mrs. H. of Glens Falls, N. Y. Age fifty-eight; married; occupation, housewife. Came for consultation April 10, 1919, giving the following history: About twelve years ago the patient began to notice a general feeling of debility, with gradual stiffening of all muscles of the body, general distress during the day, and restlessness at night. Had a tendency to doze off at any time when sitting. Irregular heart action with disagreeable pounding sensation. She had been very fond of reading and walking, but gradually lost interest in the former and found walking difficult. About a year and a half ago a fall resulted in a fractured hip, and since then the symptoms have been more marked.

Diagnosis: Septic toxemia due to focal infection.

Oral examination: The mouth and teeth revealed no macroscopic pathological indications, except a few broken fillings and small cavities.

X-ray examination: Radiographs showed periapical rarefaction involving the apical pericementum of the upper left second molar.

Galvanic test: The pulp was necrotic. This tooth had a large amalgam filling, but gave no apparent discomfort to the patient.

Prognosis: There were but two procedures, either extraction and curetment of the alveolus, or root sterilization by silver reduction with the hope of rendering the tooth aseptic.

Treatment: The treatment decided upon and given was routine Howe procedure, with the following reactions: After the first treatment the patient experienced a marked improvement in her general condition. She called me on the telephone the following day and said she would hardly believe there could be such a change in so short a time. Following treatment there was general relief from the sensation of muscular tension. The patient slept comfortably and felt rested. Mind was clearer; heart action normal. This condition continued for five or six days, when symptoms of the old discomforts began to return, although not so severe as formerly. This continued for the next four or five days, or until after the second treatment. The second treatment was followed by the same marked improvement. After the succeeding four days the root-canals were filled and the operation completed. Since that date, which was May 2d of this year, her recovery has

been rapid, with no relapse, and without the aid of internal remedies. The second day following the filling of the tooth the patient discarded her crutches for the first time since leaving the hospital, and walks comfortably with a cane.

The following interesting incident occurred in connection with this case: After the radiographs had been taken and it was found that a tooth was affected, the patient called her family physician on the telephone to convey the intelligence to him. He said, "Did you have it out?" She said: "No, I am having it treated." The doctor then slammed up the receiver, with no further remarks.

It is lamentable that physicians and dentists do not work in closer harmony; that some physicians cannot seem to realize that upon dental subjects they are as incompetent to give advice or make a diagnosis as is the average dentist when he attempts to step outside his own special field, or when he presumes to give advice or prescribe for some physical ailment which is within the exclusive field of medicine. Frequently, if the patient is able to be about, a physician will advise his consulting a dentist for any dental disorder, but in cases of metastatic disease which might arise from the teeth, the only treatment they seriously respect is extraction. It is possible that this situation may be as much the dentist's fault as the physician's.

The association of many systemic disturbances with certain conditions about the apices of roots has frequently been traced directly to the true foci, with results similar to this case. The exodontist, however, with characteristic enthusiasm for his calling, has done much to discredit the possibilities of treatment and tooth retention. The oral surgeon, on the other hand, has probably done more to cement the relationship between the dentist and the physician than any other factor. This is one of the good things which have been developed by the war. As someone has recently said, "The difference between the oral surgeon and the average exodontist is that the oral surgeon is a true surgeon, who confines

his field of operation to the mouth and who possesses the modern surgical sense, while the exodontist too frequently fails to appreciate the possible seriousness of a simple extraction. The surgeon is familiar with the hospital idea and follows closely its precepts, while the exodontist retains the ingrain carpet traditions of his preceptors. A physician with hospital training can no more be expected to fraternize with such as these than can we dentists be expected to call a barber or chiropodist in consultation."

Oral prophylaxis, hygiene, and periodontia are without doubt the trio in practice which promise more for the control of the ills of humanity than any other departments of the healing art. But to acclaim them a panacea is assuming that the millennium in health conservation has arrived, and that caries, involved pulps, abscesses, necrosis, the necessity for restorations, etc., are conditions of the past. So the thoughts of the dentist's mind need be no longer confined to the path "leading from the laboratory bench to the operating chair," as the report suggests, for our whole philosophy will have been changed, since human suffering from bodily ills will have vanished.

Unfortunately, we cannot look quite that far into the future. There is still a large percentage of the world's populace who never seek the services of a dentist except for some radical treatment. This situation is due as much to lack of education as it is to lack of means. Nevertheless the possibility is remote of eliminating from our practice various disorders we are now obliged to treat. Furthermore, evidences are being brought to light by research and observation which tend to preclude the probability, if not the possibility, of such a millennium. For example: It has been reported that our celebrated surgeons, the Mayos, have established the rule of refusing to operate for a patient who has in the mouth a "dead" tooth.

It has also been pointed out by Howe, in a paper appearing in the January 1919 issue of the DENTAL COSMOS,

that "The mere presence of the streptococcus viridans in a pyorrhea pocket and in a gastric ulcer convinces certain scientific authors that the pyorrhea is the cause of the gastric ulcer; and on such evidence it is just as reasonable to state that the gastric ulcer causes the pyorrhea. The mere presence of the micro-organism amounts to nothing, for it is also present in healthy mouths." He further "protests against the indiscriminate extracting of teeth for their effect upon general diseases—about which no one as yet knows much."

Again, an equally eminent writer, Dr. Clarence J. Gries, in the August 1918 issue of the *Journal of the National Dental Association*, states that he "does not believe an infected or abscessed root-apex should be retained for a minute, nor would he spend that time on one, unless attempting apicoectomy." However true this statement may be, I think cases can be shown where many teeth with infected and abscessed periapical areas have been treated, and the treatment has been followed by a filling in with deposits of healthy bone tissue. Furthermore, it has been found possible by the silver reduction method to treat many teeth where the operator had succeeded in opening the root-canals but a short distance, so that periapical rarefactions have subsequently disappeared.

Until the dental and medical professions shall have acquired more accurate knowledge concerning the causes of various diseases, and adopted more specific methods of treatment for their cure, we shall continue to have this same diversity of opinion. The laity, too, must be more definitely informed as to the proper rules to follow for the preservation of health, before they will appreciate the value of every organ of the body. They will then be in a better position to select the particular specialty they may need to employ when the case demands, and provide suitable and adequate services for those unable to pay even a nominal fee. And finally, a better co-ordination of all the various specialties of medical science will bring us nearer to a solution of our great problem.

Dr. T. P. Hyatt, New York. In my opinion no paper has been presented to our society in recent years which is so full of significance for the future of dentistry as the one just presented by Dr. Stillman.

Preventive dentistry will not only be of the greatest value to the patient, but also to our profession, inasmuch as it will enhance public appreciation of our service. More than this, realizing as we do the serious consequences of dental neglect and the subsequent injury to the health, preventive dentistry will prove of national value.

There are certain points to which I should like to call special attention. In an examination of 76,000 teeth which were studied for the purpose of ascertaining which of the five surfaces were most susceptible to decay, the following percentages were found:

Caries affects—

Lingual surfaces	.....	1.3	per cent.
Buccal	"	2.6	" "
Distal	"	5.4	" "
Mesial	"	6.4	" "
Occlusal	"	17.1	" "
Occlusal (eliminating incisors)		28.2	" "

I believe it is the prevailing idea among many of us that more cavities are found on the interproximal surfaces than are found in any of the other surfaces. Discussing this point one day with some friends the idea occurred to me that perhaps as the patient grows older the number of occlusal cavities might diminish, whereas the interproximal cavities might increase. The figures were studied again, and revised according to ages. The result beautifully corroborated my supposition. From the age of twenty-five to sixty the percentage of occlusal cavities gradually diminishes, while the interproximal cavities increase in number. One interesting fact was noticed in this study. Between the ages of thirty-five to forty the diminution of occlusal cavities stopped, and an increase took place. As this was found in the table for men as well as women, it is interesting, though I have no explanation to

offer. Perhaps in a study of a larger number than this it may not be verified.

In our work of giving prophylactic and preventive treatment to children the susceptibility of the occlusal surface should be remembered. These surfaces, particularly of the first permanent molars, should be carefully cleansed, and even if there is no cavity they should be dried, and cement worked down into the crevices. This will protect this surface from decay until the child is old enough to properly appreciate the care he must give to his teeth.

In the young you will find the gum tissues are well filled in between the teeth, but as the patient grows older the gum will not so well fill these interspaces. Therefore until the twenty-fifth year we should emphasize the importance of cleansing the grinding surfaces of the teeth, and after the twenty-fifth year emphasize the importance of interspace cleansing.

That systematic and regular prophylactic treatment by the dentist with the co-operation of the patient is productive of an improved condition of the mouth is conclusively substantiated by the following facts:

The employees of the Metropolitan Life Insurance Co. using the dental division have been divided into four classes, as follows: (1) Those who first came in 1915 and have continued to come. (2) In 1916. (3) In 1917. (4) In 1918. By our system of recording we describe the condition of the mouth in regard to cleanliness under the heading: CLEAN—"Yes." "No." "Fair."

The following table should be of great interest:

Class.	Yes.	No.	Fair.	
1 (1915)	27	25	48	per cent.
2 (1916)	25	27	48	" "
3 (1917)	18	29	53	" "
4 (1918)	10	50	40	" "

The table shows class 1 to be the highest under "Yes" and the lowest under "No," that class 4 is highest under "No" and lowest under "Fair" and "Yes," and that the classes show a gradual improvement

according to the number of years of attendance in our clinic.

A study of class 4 shows the following:

	Yes.	No.	Fair.
First visit in 1918 . .	10	57	33 p.c.
Second " " 1919 . .	14	33	53 p.c.

There was thus a gain of 4 per cent. in "Yes," a gain of 20 per cent. in "Fair," and a loss of 24 per cent. in "No."

I wish Dr. Stillman had emphasized this point: I do not believe there is a dentist in the room today who would argue that it is desirable to have unclean mouths. There may be some difference of opinion in regard to how much attention should be given to the mouths, but do you realize that there are numbers of things done by dentists in their offices, and by the oral surgeons also, that make it difficult for the public to fully appreciate and believe that we are presenting to them the truth unbiased, and that it is not a personal fad of ours?

How many dentists operate in the mouth before giving the patient a thorough prophylactic treatment? Gentlemen, when you honor yourselves as the surgeon honors himself you will refuse to operate in an unclean field. You will insist upon cleanliness, and by your insistence you will impress upon the patient the importance of what cleanliness of the mouth means. You must be unwilling to jeopard your work by working in an unclean mouth. I do not suppose I am any different from any of the men here, and in years gone by I put in fillings or other kind of work and then cleaned up the mouth, and showed the patient with a hand-glass what I had done. Now I have reversed the method of procedure, and insist that the mouth must be clean before I operate.

I told Dr. Stillman I should like to have the opportunity of bringing that point forward. I think this should be done by the oral surgeons, but I know that many of them do not do it. They go right into the mouth and operate, and they do not insist that the mouth be clean. They clean their instruments,

their hands, and everything else, but not the mouth. I said to one man, "Why do you operate in such a filthy mouth?" And he replied, "Oh, well, you know the mouth is such a wonderful thing that you can go in and do anything you like, and it will take care of itself."

While I shall not question the truth of this statement, I still maintain that it lessens the importance of oral hygiene in the minds of the patients, and makes it harder to teach mouth cleanliness or to secure the co-operation of patients in our work for preventive dentistry.

In regard to pulpless teeth: I do not believe any man in the room will claim that a tooth without a pulp, or with a non-vital pulp, is a normal tooth. I think all will agree with me that such a tooth is abnormal. I would not have such a tooth in my mouth for a thousand dollars. I believe in safety first. I call myself conservative, and I ask those who believe in saving such teeth to *first prove* that the retention of these abnormal teeth will not bring about abnormal conditions.

Yesterday I had the pleasure of seeing a young man in my office—Captain Ash—who has returned from the other side. He said, "Dr. Hyatt, some three or four years ago I went down to the Metropolitan and saw your work, and I said, 'Oh, that is all very well, but he is one of those awful radicals.' But since I have been on the other side, I have changed my mind. When our boys got in the trenches, and were exposed to cold and great fatigue and great nerve strain, the things that blossomed out were the pulpless teeth." I said, "Yes? But how were they filled?" "A number of them were perfectly filled, yet they also caused trouble in that abnormal environment."

I believe it was Dr. Rosenow, who in reading a paper before the First District Society, New York, stated it had been found that animals that have been inoculated and have become immune to certain diseases were immune only while their blood temperature was normal; when the blood temperature was lowered, they were no longer immune. And I believe this is largely true with our pa-

tients. So long as they remain normal in health and their power of resistance is good, these pulpless teeth, perfectly or imperfectly filled, do not produce any manifestation of systemic troubles. But when the power of resistance is lowered, or the patient is under an unusual strain, or in unusual environments, like our boys were on the battlefields of France, then these pulpless teeth will be potent causes of trouble.

I cannot believe that the cutting off of the blood and nerve supply to any part of the body is not productive of systemic disturbance sooner or later.

The sooner the dental profession gives up spending so much time in the study of trying to retain pulpless teeth, and devotes its energies to the study of pulp conservation and the practice and teaching of preventive dentistry, the sooner will be brought about a logical and saner method of dental procedure, and also a greater confidence will be shown by the public in our profession.

Dr. Ottolengui. I want to prove to you that Dr. Hyatt does not mean what he says. He says he would not keep an abnormal tooth in his mouth, consequently he would not keep two, or three, or four abnormal teeth. Therefore if all his lower bicusps and molars were abnormal, he would have them extracted; then he would have nothing to eat with except his lower front teeth, and a lot of china teeth, and they are abnormal! (Laughter.)

Dr. Stillman (closing the discussion). I have nothing further to say, except I wish to express my thanks for the kind way in which I have been man-handled!

Dr. HERMAN PRINZ of the University of Pennsylvania, read a paper entitled "What Constitutes Reinfection of Root-canals, and How Can It be Prevented?"

[This paper is printed in full at page 954 of the present issue of the DENTAL COSMOS.]

DISCUSSION.

Dr. R. Ottolengui, New York City. I find myself in such sympathetic accord with the major part of Dr. Prinz's

paper that I think time will be conserved and Dr. Prinz himself entirely satisfied if I discuss immediately the only portion of his discourse with which I cannot agree.

The exception which I shall take is slight, and yet I think it is important, since we are dealing with a micro-organism which we are told is only one micron in diameter, and that we must perfectly occlude the openings to the root-canal if we would safeguard a tooth.

I desire to say a word first in relation to reinfection of root-canals. Dr. Prinz told us that, once these bacteria have entered the tubuli, they practically cannot be destroyed by sterilization, because the only way to destroy bacteria with a germicide is to have the germicide in actual contact with the bacteria, and of course with all our germicides we effect but a surface contact. I mention this merely to accentuate Dr. Prinz's contention that the safeguarding of the tooth must depend upon the occlusion of the canals.

Let us analyze the situation. In an infected tooth we have bacteria in the dentinal tubuli to a greater or lesser depth, this in itself being a debatable question. Now, then, can these bacteria find exit from these tubuli at both ends? I think not. I think they must get out of the tubuli, if they get out at all, through the entrance which admitted them, viz, the end which terminates in the canal wall.

I have recently seen some marvelous sections of teeth made by Dr. Harold Box. He has been able to differentiate, as no previous histologist has done, the interlacing of the tubuli by means of microscopic canals. Some of these pass directly from one tubule to another, while others appear to branch out but terminate in the space between the tubuli, a fact which leads one to assume that by this means nourishment of a sort is carried to the intertubular tissue.

Dr. Prinz today tells us that these tubuli vary from 4.3 mm. to 4.5 mm. in their widest diameters, and from 1.3 mm. to 1.5 mm. in their smallest diameters, so that a bacterium only 1 mm. in

diameter easily finds passage. But the interlacing canals which Box has demonstrated are smaller than 1 mm., so that the bacteria must be restricted to the tubuli themselves.

Very good! Now, reaching the terminals of these tubuli, what do they find? Here we have the granular layer of Tomes, and the heretofore supposed solid inner layer of cementum, which is in contact with the outer borders of the dentin. But Dr. Box has apparently demonstrated that this is not an impervious zone, and that the terminals of the tubuli or minute canals therefrom do cross this area and anastomose with canaliculi of the cementum, so that there is perfect communication between the two. But Box thinks (and I hope I do not misquote him) that though this intercommunication does exist, the passageways between dentin and cementum are too small in diameter for the passage of a blood corpuscle, and that they carry lymph or serum only. This would seem to preclude the passage of bacteria from the dentin out through the cementum proper, and would indicate that if bacteria ever escape through the sides of roots, it must be through larger canals, the exits of which we have been calling extra foramina.

Hence it would appear, and practical clinical experience substantiates this view, that infection beyond the root must pass out through a true foramen. If, then, complete sterilization is impossible, the salvation of the tooth depends upon complete occlusion of all foramina and the perfect blocking of the canal terminals of the tubuli, so that, as it were, bacteria cannot "back out" therefrom, and then escape through a foramen of some kind into the apical region. In other words, if the canal proper can be perfectly sterilized, it must be filled promptly and perfectly enough to prevent reinfection thereof by the exit of bacteria from the tubuli into the canal.

Dr. Prinz recommends the immediate filling of the canal when once sterilized thoroughly, and describes his technique. He advises the use of acetone because of "its rapid evaporation." It is exactly

that attribute of acetone to which I object. Further considering his method, it seems to me that if we first varnish the canal and then use a solution of gutta-percha in paraffin oil mixed, as he recommends, to a butterlike consistence, and use this as a lubricant for gutta-percha cones, we destroy all opportunity for accomplishing the most vital element of our purpose. This is, not that we should get the gutta-percha into the canal, but that it should be in absolute contact with the canal walls. And I would doubt the perfect contact of a filling made in this manner.

It seems to me that at present our best hope lies in first using a rosin solution very thin, following this with chloro-percha, and packing into that, piece by piece, tiny cones of gutta-percha; and packing these in such manner that they gradually absorb the chloroform, while coincidentally increasing the density of the gutta-percha mass within the canal. A root-filling of this sort is not a cone forced into a canal, but many cones manipulated in such manner that we have a homogeneous gutta-percha root-canal filling in the closest possible contact with the canal walls. Moreover, this method of introducing a root-filling, in the majority of cases, fills or occludes every foramen, provided the canals leading to them have been perfectly cleansed.

Dr. A. R. Cooke, Syracuse. At the present time we are not inclined to take issue with the assertion made by the essayist that "an incipiently infected root-canal cannot be sterilized permanently by the antiseptic methods of treatment now in vogue," and feel that we must content ourselves for the present at least with such sterilization as is possible without injury to the living tissues of the jaw.

However, the profession seems to have become obsessed with the idea that this result can be obtained by the use of the most powerful caustics and germicides known to chemical science, and, moreover, has not hesitated to use the same in the most concentrated forms obtainable, even resorting to the action of nascent compounds with a view of secur-

ing greater penetration of the tubuli. We have not hesitated to apply these materials to effect chemical changes in which the vitality of surrounding tissues has become involved, and subsequent destructive processes established in tissues external to the teeth.

The use of formaldehyd preparations in the treatment of root-canals and as ingredients of root-canal fillings has become well-nigh universal, whereas it is a well-known fact that the vitality of all cell tissues is permanently destroyed by contact with this agent—hence its preservative powers—and, as has been shown by our esteemed essayist in other writings, this agent when used as an ingredient of desensitizing paste will permeate the tubuli, destroying the vitality of the pulp, and conversely, if used as a treatment of root-canals or as an ingredient of root-canal fillings, will cause death of the tissues surrounding the root-apex and of the adjacent pericemental membrane. The most extensive rarefactions that I have seen about the roots of teeth have been in cases in which such materials have been used as an ingredient of the canal filling. In view of our present knowledge of the action of formaldehyd on protoplasmic matter it should be most emphatically stated that it should never be used in any form or for any purpose within the tooth.

To show the amount of these preparations used annually I may say that a prominent dental supply house recently advertised that their annual sales of one root-canal treatment and filling material of this kind amounted to 36,000 bottles, which of course is a mere fraction of the total used, for there are many similar nostrums on the market, and it is an easy matter for the individual dentist to prepare one from chemicals at hand. I do not hesitate to state that a very large percentage of our present apical disturbances could have been prevented by the elimination of this chemical and its compounds from our practice.

Having granted that perfect sterilization of the tubuli is a present impossibility, our safety lies in sealing in the 25 per cent. or so of organic matter, and

in not allowing the tubuli to discharge their contents either into the canal or the tissues about the tooth.

Several interesting situations must follow this conclusion: (1) It will be impossible to cut off the end of the tooth root *in situ* without infecting the surrounding tissues, and our much-vaunted operation of apicoectomy must be abandoned. (2) All of the findings of investigators and practitioners who have tested extracted teeth for septic conditions by cutting off the root-ends, placing the same in culture medium and incubating, must be discarded as useless, for they have opened the tubuli and produced infection from the deeper layers of the dentin, which admittedly are non-sterile. (3) Scrapings from the root-canal may be non-sterile on one side, and findings from such source may be useless. (4) We must seal them up as completely as possible and forget it, or extract the tooth.

While we recognize that putrescent canals are filled with bacterial growths, unnecessary increase of these by the careless introduction of foreign material should be avoided, and the pulp-canal débris should be removed under as aseptic conditions as possible, that the peri-apical tissues which have previously been exposed to the contained infectious material may not be further contaminated. It may become desirable to have a perfectly equipped bacteriological laboratory, a trained bacteriologist, a radiologist, an expert chemist, and a clinician for every case. I have no doubt that the recent graduate feels fully prepared to render such service, but the general public must be served at less trouble and expense in some efficient way by the older members of the profession who are not supposed to understand the intricacies of such treatment.

The chemical treatment of root-canals by the use of sodium-potassium is open to the objection that the hydroxids formed may be, and often are forced through some of the apical foramina, producing more or less deleterious effects upon the tissues exterior to the teeth, with resulting soreness and unlimited possibilities. It should be borne

in mind that these alkalis are not self-limiting in their action, that they destroy the tissue by dissipating the organic matter, and that in the nascent state these effects are more deleterious than had the ready-formed hydroxids been used.

In a recent experiment sections of a jawbone were completely disintegrated when allowed to remain in a solution of sodium-potassium hydroxid, and it is a sad fact that workmen in our soda-ash plant occasionally fall into the vats, and are seen no more.

Sulfuric acid treatment. The speaker prefers the use of 50 per cent. sulfuric acid, which is self-limiting in action and even when carried through the foramen causes no apparent disturbance, acting on the diseased tissue only, if such be present, and stimulating the living tissue.

Dr. Garretson, of revered memory, used sulfuric acid quite extensively in the treatment of bone caries, dissolving out the necrotic bone with a 10 per cent. solution or full strength aromatic sulfuric acid, and secured stimulation of the surrounding tissues when the carious cavities were packed with gauze saturated with the acid.

Dr. George Pollock, F.R.C.S., who originated the use of sulfuric acid as a treatment in bone caries, writes as follows:

The acid does not affect or injure the soft tissues when used in the diluted form; acting chemically on the diseased bone alone, it does not affect the living bone, and its application is seldom followed by any great degree of pain. That, in the diluted form, it will only act on dead or diseased bone and not on healthy bone, is a point of very considerable importance, and is the great advantage sulfuric acid possesses as an application, under the circumstances quoted, over the use of the gouge or of the actual cautery or of caustic potash. The following experiments, conducted at my request by Mr. Henry M. Noad, lately my clinical clerk, satisfactorily prove the correctness of this statement. Portions of dead, diseased, and healthy bone were selected and subjected to the action of sulfuric acid, viz, (1) Dead bone, 10 grains. (2) Diseased bone, 10 grains. (3) Healthy bone, middle age,

10 grains. (4) Healthy bone, old age, 10 grains. These were exposed to the action of a mixture of sulfuric acid and water, one part in four, for three days, at a temperature of about 100° F. The following were the results:

(1) Dead bone—Phosphate of lime, 2 gr.; carbonate of lime, 3.30 gr., dissolved in the mixture.

(2) Diseased bone—Phosphate of lime, 2 gr.; carbonate of lime, 1.3 gr., dissolved in the mixture.

(3) and (4)—In both specimens of healthy bone, no action took place.

The process of disintegration or dissolution with the commencement of healthy granulation from the surface of the living bone may be observed simultaneously progressing in an exposed surface of dead or dying bone to which the acid may have been applied.

When used in root-canals the acid should be applied by means of a platinum-tipped minim syringe in sufficient quantity to partially fill the pulp cavity as well as the root-canals, into which it is carried by capillary attraction aided by the use of a very fine smooth broach that may be forced well to the apical foramen. The canal having been enlarged as desired, the acid is neutralized by the application of suitable alkaline solutions, the excess moisture is absorbed, and the canals dressed with chosen antiseptics. Being self-limiting in action on the inorganic matter, and having little or no effect on healthy tissue, as shown by Pollock, no harm will result from the minute quantity that may find its way through the foramina.

Therapeutic treatment. Since, as previously stated, we do not expect to secure sterility of the dentinal tubuli, it seems unnecessary to resort to the use of extreme germicides when the organic matrix left on the inner surface of the root-canal can be saturated with a mild antiseptic, such as beechwood creasote, and made sterile for the time of treatment and until filled with an antiseptic root-canal filling.

The application of chlorin preparations, such as dichloramin-T recommended by the essayist, may prove more efficient, and after a thorough test of at

least ten years may give us positive results. A lesser trial period should not be considered conclusive, even though theoretically the method may promise success. We have all been too willing to depart from tried methods, seeking an easier or more promising result in the use of new processes.

For many years the speaker has consistently followed one line of root-canal treatment and filling, with minor changes instituted from time to time as suggested, kept complete records of all cases, and since the general use of radiographs began has made an unselected collection of radiographs covering the period, with the result that while but part of the root-canals appear to be thoroughly filled there is a general absence of large rarefied areas, and more than 75 per cent. of the roots would be considered to be in a healthy condition as far as the radiographs show.

"Be not the first by whom the new is tried, nor yet the last to lay the old aside" is quite as applicable in the practice of dentistry today as when uttered by the immortal Alexander Pope *in re* the proper use of words.

The antiseptic principles recommended by the essayist for the establishment of sterility are essential in the use of any antiseptic or germicide, and we must assure (1) absolute contact, (2) sufficient time, (3) concentration at the point of contact. For these reasons the speaker prefers to plug the canals as thoroughly as possible at each treatment with a small twist of non-absorbent cotton saturated with the chosen antiseptic. In this way the apical foramina are effectively closed, and ingress of lymph or other fluid from the periapical region is prevented. Non-absorbent cotton is chosen as making a more impervious plug and being more easily passed into the canal by the means of the smooth broach used as a plugger.

The choice of root-filling materials is largely determined by convenience of working if one depends entirely upon the sealing effect of the filling rather than upon its therapeutic value. Solutions of rosin and gutta-percha with the gutta-

percha cone have no antiseptic effect, and are not used without additions.

The following solution will be found to be adhesive, antiseptic, convenient, and an efficient softener of the gutta-percha cones that are used in the canals for the permanent filling: Equal parts of base-plate gutta-percha and aristol are taken, and a thin solution of the former in chloroform is first made; when thoroughly dissolved the aristol is added with sufficient additional chloroform to make a thin solution. Should the aristol be dissolved first the gutta-percha will not readily dissolve in the mixture. As aristol has 22 per cent. of iodine in its composition, we thus have an iodine content of 11 per cent. in the finished solution. The iodine is held permanently in contact with the tubular openings, and should effectually prevent the reinfection of the canal which the essayist claims must occur in case any of the corked-up tubuli leak or by any other means in which bacterial invasion occurs.

This solution should be introduced by means of a very fine, smooth, sterile steel broach that will if necessary pass through the apical foramen, and should be of such consistence that it will adhere to the broach in four or five minute drops when the latter is dipped into the solution. It is to be carried in this way directly into the canal immediately following the removal of the cotton dressing, and without any attempt to secure dryness of the canal. The dipping is repeated until the canal is seen to be filled with the liquid by capillary attraction, and when the broach is withdrawn from the canal the liquid is seen to flow back, filling the aperture. Creasote being soluble in chloroform unites with the solution, and a closer union with the dentin is secured than would have occurred in a dry canal. Experiments made with the above-mentioned solution in the pulp chambers of extracted teeth show that the solution* adheres tenaciously to the creasote-moistened surface, rendering the use of drying agents quite unnecessary. The solution should be followed by the introduction of the finest gutta-percha points obtainable, which for

convenience in handling are mounted upon the ends of fine canal-plugger points. The first point should be carried quite to or slightly through the main foramen, and in similar manner other fine points are placed in each side of the root-canal, the final points being used as wedges to force the lateral cones against the sides of the canal. The entire mass when slightly softened by the chloroform is carefully forced upward or downward until slight pain is experienced by the patient, when the filling is considered complete.

The method recommended by the essayist of filling the canal with a single cone, following the application of butter-thick paraffin-oil gutta-percha solution does not appeal to the author, and would be applicable only in large straight cylindrical canals. The filling of mesial buccal root-canals in upper second molars and equally tortuous ones in other teeth would be extremely difficult.

In conclusion, let us not place implicit confidence in the apparent filling of root-canals to the apex as indicated by the radiograph, for there might be at least one of the 37,600 tubuli per square millimeter mentioned by Roemer that remained unsealed, and out of which might come 16,000,000 bacteria per twenty-four hours, as estimated by the late Dr. Willoughby D. Miller.

Dr. H. W. Rosalsky, New York City. I have listened to Dr. Prinz's paper with great pleasure, and agree with everything he has said with but one exception, namely, the filling of the root-canal. I believe with Dr. Callahan and Dr. Rhein that we should fill not only the apical foramen, but all lateral foramina wherever possible. In my opinion there is only one way of accomplishing this; that is, by working with a plastic mass and condensing it thoroughly. Then after the chloroform has evaporated we have a hard, dense, homogeneous filling. I have cases where I have filled lateral foramina that were distant from the apex two-thirds the length of the root.

The breaking off of the excess filling material that encapsulates the root-end,

which Dr. Ottolengui says happens, I have never found to occur in my cases, although I have filled and examined radiographically the root-canals of hundreds of teeth.

As for Dr. Ottolengui's method, where he tries to avoid too much excess, I think the same end can be accomplished by carefully following Dr. Callahan's technique. I fear a possible reinfection of the canal where an attempt is made to seal the apical end and it is not sealed, and allowed to remain so for twenty-four to forty-eight hours, sometimes a week. I contend that the canal must be thoroughly filled and the apex encapsulated immediately after ionization in order to prevent a hematogenous infection.

I believe in adhering to what Dr. Callahan has given us to flood the canal with, namely, a chloroform and rosin solution, then the use of a gutta-percha cone approximately the size of the canal. The cone is passed to about one-sixteenth of an inch from the apex and with a pumping motion it is worked up and down the canal, always being careful to keep the cone the sixteenth of an inch from the apical end. We continue this pumping motion until we feel that we are manipulating a soft plastic mass, and then we gently press this mass home. Next we take some sterile Young's "A" broaches wrapped with cotton wisps and dip them in the chloroform-rosin solution. This solution is again pumped into the canal, and once more followed with a gutta-percha cone of suitable size, being always sure to thoroughly condense the mass with root-canal pluggers. This operation is repeated, until we feel that we cannot get any more filling material into the canal. Then a plugger is moistened with chloroform, the whole mass well compressed, and finally covered with zinc oxychlorid cement. By following this technique we are apt to fill lateral foramina that we never knew existed.

We are thankful to Dr. Rhein for laying so much stress on the importance of the use of sodium and potassium, which is of great value in aiding us to fill the lateral foramina. I therefore prefer its use to that of sulfuric acid.

Dr. M. L. Rhein, New York City. In sitting here and listening to the discussion I wondered, if we could transport ourselves to fifty years from now, whether this discussion could not be compared to that wonderful work of Don Cervantes, called "Don Quixote"—in the fight of that warrior against the wind-mill. To me, it is an intense disappointment to think it necessary to take this time to discuss the question of the reinfection of root-canals. That is not the question that interests us in the pathology of this subject. It is the alpha and omega of treating root-canals.

I keep a very accurate clinical record of all my cases, and defy anyone to go over that record and find one case of reinfection of a root-canal. It is inconsistent with the proper, cleanly, surgical treatment of root-canals. I might almost say it is a surgical impossibility—if a man understands the first principles of aseptic dental therapy for such cases—meaning by this the removal of all organic material from every root-canal, however tortuous it may be, however many deltoid communications there may be. If this cannot be accomplished, such a tooth should not be kept in the jaw.

In my estimation, there is nothing Professor Prinz does or writes that is not intensely interesting and enjoyable; but I question most seriously the reliability of his statement when he says it is impossible to sterilize the dentin and the tubules and the canaliculi of a tooth.

Having experimented considerably in this direction, we must realize that it is one of the most difficult things to go into the research laboratory and work in this field without the possibility of error. The liability and possibility of external contamination presents itself at every turn. Professor Prinz makes the statement that electro-sterilization does everything that the dichloramin-T will do in this respect, but he recommends the dichloramin-T because so many dentists cannot afford the apparatus, and also for an economic saving of time.

My experiments with electro-sterilization, while they are not ready for publication, lead me to believe that by this

means it is absolutely possible to sterilize the entire root-canal. Judging from Professor Prinz's writings on this subject, in which he shows the variation of the ions as they travel in the direction of least resistance, it appears that he has failed to take into consideration the possibility we have of controlling the flow of such ions—that is to say, stopping their egress through any foramen by using a mechanical insulation of gutta-percha, and thereby diverting the current so that it will flow laterally toward the cementum.

If this is so, it is impossible to substitute dichloramin-T or any antiseptic for electro-medication for the purpose of root-canal sterilization. How will anyone answer the fact that my clinical records for over thirty years show not a single case of canal reinfection? Some of these cases have gone for months without sealing the foramina, and having the canals filled only with sterilized cotton covered by some hermetical seal.

I thoroughly agree with his statement that the hermetical closure of the root-canal is an absolute preventive against reinfection, and if there is any reinfection it is simply due to the operator's imperfect technique. A large percentage of dentists have no realization of what a gutta-percha root-filling means. It is no easier to insert than a contour gold filling. It is one of the most difficult of operations. To many dentists this means merely the insertion of a gutta-percha point or a cone—which I discredit entirely, because I think it interferes with ideal gutta-percha root-filling. Added to this there may be some little plastic manipulation, but work of that kind does not begin to cover the ground.

The value of base-plate gutta-percha and chloroform is undoubtedly the ease with which the chloroform is volatilized, and the basic gutta-percha left there in its original condition—as Professor Prinz has said, a material that is unalterable and unchangeable. Dr. Ottolengui's objection is well taken, when he objects to the use of acetone as being too volatile.

The most unfortunate thing that has

entered into the whole technique of root-canal filling has been the use of rosin. The men who use it today will discredit it tomorrow. Rosin, gutta-percha, and chloroform together are incompatible—they will not mix chemically. Attempt it, and see what you will find. The result is like a piece of Swiss cheese, full of holes. How can you solidly fill a root-canal with substances that are not compatible, that are not miscible? Rosin has been recommended, and I dislike very much to criticize anything given out by Dr. Callahan. Dr. Callahan and I entered practice at the same time. There never was a moment in our lives when there was any lack of friendship between us. Dr. Callahan introduced H_2SO_4 not in 1893, but in 1882. In that year he gave a clinic upon its use in Dr. Atkinson's office in Ninth st., in New York City, and I am sure Dr. Ottolengui will remember the occasion. We used sulfuric acid during all the '80's. We were experimenting and using the acids up to the time that Dr. Schreier came to Chicago in 1893, and gave his clinic showing the value of potassium and sodium. It is historically important that such dates should be correct. I want to emphasize the fact that of all the rosins, the finest distilled rosin as used by the violinist is one of the worst of which we know for root-canal filling. It has many substances in it that are dissolvable, that biologic chemistry has been unable to analyze. Take a piece of rosin in your mouth, and it has a distinct taste. It is an unstable product. If you take a solution of rosin and chloroform and gutta-percha, as we have done, and put it in distilled water, or in a sterile physiological salt solution, within a short time you will find an immense collection of fungous growth around the bottle in which your water is, due to the unstable compounds in the rosin. Is that a safe substance to introduce in the periapical region—something that will deteriorate, and of its own deterioration result in fungoid growths?

Furthermore, what kind of a mixture do we obtain? Not a chemical mixture—of course we can always make a me-

chanical mixture; it gives a substance so brittle that the slightest touch will fracture it. I have conducted a long series of experiments, and have taken rosin and gutta-percha in distilled water, in physiologic salt solution, and in blood serum, and the results are the same. It assumes this brittle condition in which the slightest jar fractures it, showing this Swiss-cheese appearance underneath. Compare this with a solution of the gutta-percha and chloroform. After the volatilization of the chloroform there is an absolute return of the gutta-percha to its inert condition, the same as when sold to us by the manufacturer. It is the addition of rosin that has brought discredit on the gutta-percha root-canal filling.

Formerly I used eucalyptus, but I have given it up as useless, and to simplify the therapeutics of root-canal filling I irrigate the canal with a solution of mercury bichlorid in hydrogen dioxid, and then the dehydration of this solution leaves an imperceptible amount of the germicidal agent at the end of these microscopic tubuli. I claim that now when you use your solution of chloroform and base-plate gutta-percha, you can drive it into the tubules; you can drive it as far as you can rosin.

If what I have said is true, if rosin will throw out fungoid growths and base-plate gutta-percha is inert, is it not better and safer for us to force that gutta-percha uncontaminated with rosin into the canals, than to force a material of which the best chemists today have not obtained an analysis?

In reference to the discussion of sodium and potassium *vs.* sulfuric acid, we hear always a great deal about the hydroxyl that results. This results from an improper use of the sodium and potassium. The proper method is to use it in points no larger than the head of a pin, and that amount of material does what? It leaves no residue that is perceptible. It leaves a little carbonate. What is its chemical action? It is simply its intense affinity for H_2O . That causes a terrific and intense marriage with any substance that has water in it,

and that marriage is so intense that an oxidation takes place; and when that chemical marriage is over, and you have used a sufficiently small amount of the sodium-potassium, there is nothing left except a little bit of dry ash.

But what is the result when you use sulfuric acid? We cannot confine ourselves strictly to the root-canal, because it is generally necessary to go through the foramen. With sodium and potassium you can do no harm. There is nothing left in the periapical area that interferes with the natural absorption of the eschar formed there. Not so with sulfuric acid. Put any acid into the tissues, and you have left a substance that remains after that acid has ceased to act. You have the same condition left that you have in any mixture or combination where there is a residue, and you have a residue left in that area that is not absorbable. That is the great objection to the use of acids in any form in the periapical region.

The crux of this subject is not in the root-canal, it is in the periapical area, and the crux of that subject is in the question of extraction or non-extraction. The most important point in this entire question is that we do not know the real pathogenic virulent microbe from the harmless one. You cannot say you have a sterile condition of the root-canal or the apical area after seventy-two hours of incubation, nor after twice seventy-two hours, because one thing bacteriologists are agreed upon is that the one dangerous microbe is the streptococcus viridans. That does not mean that every non-hemolytic streptococcus is dangerous. In an experimental examination of over 1500 tubes I have failed to develop the viridans in less than seven days. What good is seventy-two hours' incubation if it takes over six days to develop the viridans type of the streptococcus? It is the most attenuated form we have. It is so lacking in vitality that it takes all this time to develop, and it is the one great devil we have to contend with.

Here is the thing that needs our attention. The time has come when no dentist has a right to fill a root-canal

until he has bacteriologically demonstrated not only its sterility, but also the sterility of the periapical field. That is the point to which root-canal evolution has come. When he can do that he is on safe ground, and when he cannot he is on very unstable ground.

Dr. Prinz (closing the discussion). The question of root-canal treatment and filling will always provoke a most interesting discussion, because it is really the bread and butter of the dentist. Everyone has his own procedures and his own methods, and his own pet thoughts about it, and we never come to the end.

In reference to what Dr. Ottolengui said, as to drying out the rosin solution or not, that is a matter of preference. I prefer to dry it out, because I know I get an absolute waterproof film. You may get that when leaving your rosin-chloroform solution to emulsify with the cone direct. I prefer to use a small amount of paste, which is not shrinkable, and I emulsify that with a cone or the base-plate gutta-percha. We all seem to agree on the one point of hermetically sealing the end, and we have our individual ways of accomplishing it.

One gentleman asked in regard to the difference between the ionization and the dichloramin-T. There is no difference. With the ionization you will not go farther with the liberated chlorin than with the dichloramin-T. Whether you use the apparatus or not makes not a particle of difference.

Dr. Rhein. Except that in dichloramin-T it is impossible to use enough to get the sterilization.

Dr. Prinz. There is no reason why you cannot use enough if you take the time.

Dr. Rhein. It would take a very long time.

Dr. Prinz. There is ample chlorin to affect all surfaces with which it comes in contact. When I said seventy-two hours were required, I meant there was no result with regard to growth. Dr. Rhein said it took seven days. Well, take seven days if you think it better. The dichloramin-T in solution furnishes ample sufficiency for the area of surface

sterilization, and it will not go any farther than your ionization. A copper sulfate solution shows very distinctly by the green color; but the patient will not tolerate it. Outside of the mouth you can use any amount of amperage, and it shows very nicely.

Dr. Cooke has brought out his own method, and I am sure he achieves results. There are many ways leading to Rome.

I want to emphasize that the mechanical shaping and cleansing of the root-canal is the important question. The final therapeutic application of medicinal substances is a secondary factor. The other is the important thing.

Finally, if I wanted to enter into a lengthy discussion of what Dr. Rhein has said, it would be simply impossible. His chemistry and mine do not agree, for the simple reason that his chemistry is not taught in textbooks. I was taught in college, and my chemistry differs totally from his. He says that rosin has not been analyzed, and there are vegetable growths, and it is the worst thing to use, etc.

My rosin solution, according to Callahan, I evaporate. I never talked about acetone in connection with this; it has nothing to do with it. I take a cone or piece of gutta-percha and use the paraffin oil on account of the butter-like consistence which aids me in forcing it to the apical end. Whether there is a little cap formed, or not, I am not speaking of that. Dr. Rhein and I do not agree on the chemistry of the rosin, or the chemistry of the decomposition of his sodium dioxid. He talks about a carbonate being formed. Where does it come from?

Dr. Rhein. I did not say it formed there. I said the product was simply a carbonate—that there was simply a little ash there.

Dr. Prinz. If you place sodium dioxid in water in which there is organic material—whether a piece of flesh, or decomposed pulp, or a piece of albumin—within a short time there will be nothing left which is visible to the eye. There is no carbonate, no ash, nothing.

If you want to prove that on your own body take a little bit of it and place it on your skin, and the next day there will be a hole there. There is no further discussion necessary about that.

It has given me the greatest pleasure to be with you. These little stir-ups that Dr. Rhein and I occasionally have all help the profession at large to pick out just those points that are interesting and serviceable. In your own practice you will not take my word as being law, or Dr. Rhein's word as law, but you will make experiments and use the best thing. One operator obtains excellent results

with one method, and another with something else. I do not say that the rosin solution is the worst thing you could put in the canal. We want to obtain results, and do the best we can for our *clientèle*. We do not want to extract every tooth that has a dead pulp in it—it will be a sad day for dentistry when that time comes. We want to do the best we can, and if I have been of service to any one of you, I am very much pleased, because that was my object.

Adjourned to 8 o'clock P.M.

(To be continued.)

Maryland State Dental Association.

Annual Meeting, held at Baltimore, Wednesday, Thursday, and Friday,
June 11, 12, and 13, 1919.

WEDNESDAY—Afternoon Session.

The meeting was called to order by the president, Dr. Luther M. Parsons, on Wednesday afternoon, June 11, 1919, at 2.30 o'clock.

Dr. PARSONS. Gentlemen, I have waited for a larger audience, but seem to have waited in vain. We will open our annual meeting, as usual, with prayer.

The Rev. Dr. STEELMAN of Baltimore invoked divine blessings on the deliberations of the society.

Dr. PARSONS. It is the custom in opening the meeting to have the vice-president take the chair, while the president makes his address, but in the absence of the vice-president, I will ask Dr. Kelsey to take the chair as president *pro tem*.

The President then read his annual address, as follows:

President's Address.

By LUTHER M. PARSONS, D.D.S., Baltimore.

Members of the Maryland State Dental Association,—Gentlemen, we are gathered for our annual enjoyment of good-fellowship and exchange of ideas. Our profession is progressing with such leaps and bounds that it is necessary for us to have occasions of this kind to make us realize not only what we have accomplished, but how we can do more and more for the benefit of humanity; for after all, is not the first principle of our practice to render service to our utmost to our fellow beings? It is given to some through special application and study to excel in good works, and to give advice, strength, and fighting power to our army arrayed against the relentless foe, dental disease. It is a matter of vital importance for all of us to realize that no matter how well equipped this army is, it must fight valiantly, shoulder to shoulder, if the outcome is to be satisfactory. The Maryland State

Dental Association—what does it mean? It means the union of Maryland dentists for the purpose of mutual exchange of ideas, and the strengthening of each individual member in his profession. Therefore, get the thought firmly fixed in your mind that this is your meeting. This program is arranged for you; you are expected to enter into all discussions. You are asked to be punctual, and you will therefore gratify your committee who have worked hard to make this convention interesting and helpful.

All papers will be read in this room. The dental clinics will be held in the Baltimore College of Dental Surgery. The surgical clinics, including Dr. Furfey's clinic, will be held at the College of Physicians and Surgeons.

There is so much that has taken place in the dental world in the last year, and so much knowledge has been gained, that we want full attendance at all these meetings. We are to have a great deal of work shown that has been the outcome of the war, and I hope every member here, of this splendid enthusiastic audience, will take it upon himself to bring out all the others of the 500 whom we are to have at our meetings.

The President then resumed the chair.

Dr. PARSONS. It gives me great pleasure to present our staunch, splendid friend, Dr. CLARENCE J. GRIEVES, who is to give us the benefit of the knowledge gained by him in the navy at the Great Lakes station, where he had ample opportunity to observe many things of the greatest interest to us. Dr. Grievess will speak to us on "Ultero-membranous Gingivitis, the Gingival Phase of Vincent's Disease."

[This paper was published in full at page 819 of the September issue of the DENTAL COSMOS.]

DISCUSSION.

Dr. PARSONS. Gentlemen, I think we are very fortunate to have the benefit of this wonderfully prepared paper. It represents unusual work and unusual experience, and application of that ex-

perience. I want to thank Dr. Grievess for bringing to us such a splendid paper, from which we are all bound to be much benefited.

Dr. B. L. Taylor, Washington. I hardly feel competent to discuss the paper, as it is along new lines and in a new field, but it has been interesting to me, and I feel Dr. Grievess has not only done himself great credit, but the dental profession as well, in presenting it at this time. The fact alone remains that we must stamp out this disease; the medical profession has not been able to diagnose it, and it is the duty of the dental profession to be able to do so, and in this way help to stamp out a disease that will soon be as common as pyorrhea.

The paper was very, very interesting to me. Unfortunately, I have not had a case of "trench mouth" under my care as yet, though there have been a few cases reported in Washington. However, I have a case at the present time that is very similar to what Dr. Grievess has described in his paper—one of possibly eighteen months' standing, and no treatment I have been able to apply has done any good whatever. I am going to take the opportunity a little later on of having a talk with Dr. Grievess with regard to this case, to see if he can outline some treatment that will be of benefit. If the case ever reached the ulcerative stage it has passed that, and has gone into a chronic condition where it has become a general inflammatory condition of the gums, just a film coating of the tissues that appears over night and can be brushed away in the morning. It looks very similar to the condition produced after an iodine solution has been applied.

It is interesting to me that the essayist has been able to discover the microorganisms that are the cause of this trouble, and that is a phase of the subject in which the dental profession must become very firmly grounded. It is impossible for us to treat the conditions we find in the oral cavity unless we know something of bacteriology. Our pathology we know something of; we are coming to know it better every day. Every man realizes today that he must

learn something of the structures and pathological conditions, and the causes of pathological conditions, before he can treat such conditions. I will say again that it has been a great pleasure indeed for me to hear this paper. I came from Washington this afternoon just simply to be with you, gentlemen, and to hear this paper. I have heard a great many from Dr. Grieves, and have never heard one that was disappointing. He always gives us something good, and something that is based on scientific facts. It is just such men as he who are going to build up our profession. It is utterly impossible for the dental profession to rely upon the medical profession any longer. They know practically nothing of the oral conditions, and in the medical schools, as far as I know, up to the present time there is no chair which is taught by a dental surgeon. I feel, however, that the time is coming when medical schools in this country will have men who have studied and practiced dentistry for years, to lecture to them. If not, they will never be able to diagnose the disease conditions of the oral cavity.

Dr. Geo. E. Hardy, Baltimore. As my experience has been very limited, only two or three rather doubtful cases coming under my observation; I am not at all competent to discuss Dr. Grieves' paper. I greatly enjoyed hearing it, and while I cannot really discuss it, I would like to ask one or two questions.

If this disease is allowed to go on without treatment, what will be the ultimate result? Is it to a degree self-limiting, or will it bring about a gangrenous condition and necrosis? Again, in acute cases where there has been treatment and a cure, what is the general appearance of the oral tissues? Is there extensive recession of the gums or much loss of alveolar process?

It has been a real pleasure to listen to Dr. Grieves' paper. The subject is full of interest to us all just now, and the essayist has presented it in his usual thorough and interesting style.

Captain Emerson, Baltimore. I feel some embarrassment in discussing the

paper, as I have been away two years from the profession. Dr. Grieves' statement about the use of iodine and a few other of the usual treatments is very important. I have seen cases where iodine had been used and the condition was much worse, especially where extraction had been resorted to; the result is always a spreading of the infection. We always gave these cases treatment in the front line; we could not give them very good treatment, however, and if the cases were very bad, we sent them to the hospital. We used potassium chlorid and got pretty good results from it. It was the only thing we employed. We issued the capsules to the men and let them dissolve them themselves in the mouth; but the worst cases I have seen were due to extraction while the patient had this condition.

Dr. Mead, Washington. I appreciate greatly this subject, and am very interested in the chronic condition. What cases I have seen have been the acute, and were very easily recognized. I was shown a number of acute cases by Dr. Gilmer of Chicago, and have had two or three in my own practice. The treatment I applied to the few cases I had was simply hydrogen dioxide, with good results, that is, in the acute stage.

Dr. Grieves (closing the discussion). I thank you very much for your kind words.

My friend Dr. Taylor is much too flattering when he says I have discovered either the micro-organism or the disease; of course I have not, but have simply correlated the literature to my cases. As a matter of fact, in looking over the literature, it is embarrassing to find the Canadian and British medical men have done pretty nearly all this two years ago, and have brought out the dental pathology very well. However, I do not like their statement that it results from pyorrhea. It rarely results from, but may be implanted on a chronic pyorrhea, which it almost invariably induces.

Answering Dr. Hardy's question: He has as usual put his finger on the weak point. Almost anybody can recognize

the acute, but the chronic stage is difficult to diagnose, and persistently resists all forms of treatment, because it is a compound infection, being both coccal and spirillary. In these cases I know of nothing better than chlorate of potash paste; in fact, the patients are miserable without the constant use of 50 per cent. chlorate of potash in a paste, not only used as a dentifrice, but applied locally. The use of iodine or other strong germicides aimed at the coccal forms simply produces greater necrosis without disturbing the spirilla; and, if you depend entirely on remedies to control the spirilla, you are doing nothing toward destroying the coccal infection.

It is most important to recognize early the acute stage, and not let it become chronic. Have the patient use sprays with any oxidizing agent which will not act too harshly on the membrane—blowing it out, and keep on blowing it out. I know the local application of saturated solutions of chlorate of potash in a spray will make a great difference in twenty-four hours, and every hour counts in preventing the case from becoming chronic. Instrumentation is done only after the membranes disappear.

I would advise you to watch the families where the boys have come home from military service, and warn them of the danger of its passing through the household. From my observation of the marines, I can see no difference between the "trench mouth" developed in France and that of our own camps; it is all very contagious on salivary contact, and all preventable.

I thank you very much for your courtesy.

Dr. KELSEY moved that the meeting adjourn. (Motion carried.)

Adjourned until the evening session at 8 P. M.

WEDNESDAY—Evening Session.

The President called the meeting to order at 8 P. M., and introduced as the speaker of the evening Dr. Sterling V.

Mead of Washington, who read a paper entitled "The Practical Use of the Dental Radiograph."

[This paper is printed in full at page 965 of the present issue of the DENTAL COSMOS.]

DISCUSSION.

Dr. H. E. Kelsey, Baltimore. I cannot discuss certain phases of the paper, because they are outside the limitations of my work, but those pictures which related to impacted teeth and the conditions surrounding them were very interesting, and I can say they were the most decisive results I have ever seen illustrated by the X-ray. Dr. Mead seems to have the technique to bring out these conditions and illustrate them on his films more thoroughly and more decisively than most of those I have come in contact with, and that which I have had to use in my own work. I would be glad to be able to get always such pictures as Dr. Mead has shown us. If he has others not as successful as these it would not surprise me, and I would not blame him for not showing them, but where so many are shown as he has given us tonight, he must have a high measure of success. I was interested in what he said about stereopticon pictures and the elaborate technique prescribed by most of the men who have written on this subject. I know I listened to a paper a year ago at a certain meeting where the apparatus displayed for securing these X-rays was very complicated and the technique employed with the apparatus was very tedious, and one which would almost cause anybody to give it up as impracticable on account of the time consumed. But from what Dr. Mead says, he got a stereoscopic picture in a few minutes without a great deal of trouble. The stereoscopic X-ray gives the impacted tooth you are seeking a definite place in the portion of the anatomy explored by the X-ray, which the flat picture does not. I have seen some beautiful work by Dr. McKay of New York, and, if it is the average, we are neglecting a very important side of X-ray work.

I want personally to thank Dr. Mead for his presentation tonight, as well as on behalf of the committee, because of the excellence of the paper itself and its benefit to all of us.

Dr. C. J. Grieves, Baltimore. I want to express my appreciation of those wonderful pictures made and shown by Dr. Mead, and I hope before he leaves he will tell just how he does it. I have seen many slides here and elsewhere, but few with such perfect detail.

In regard to the pathology suggested by his interpretation, and the broad statement that all such areas are the primary cause of the various diseases he associates with teeth, that is quite another story. I shall not soon forget my experience in selecting for report cases of infectious arthritis, during the years 1908 and 1909, until Dr. W. S. Baer, orthopedist, agreed in 1910 that we could conservatively report thirty cases as benefited. However, to be absolutely sure, we selected only fourteen as cured—after waiting two years. I have seen those fourteen cases since, and more than half have had recurring arthritic symptoms, notwithstanding they had their teeth out. I will admit that all were not thoroughly curetted, but all other possible focal areas were ruled out, so I believe there is some other contributing factor besides oral infection in arthritis. I do not want you to get the idea that I am opposed to clearing up such areas as we have seen tonight; for if conditions are as bad as these slides indicate, there is ample dental reason why such teeth should come out, because, by proliferation, adjacent healthy teeth would be involved. Clinically I can show you as many cases where the patient had the teeth out and got no better, as those where the teeth were retained and the patient recovered. Clinical evidence is of little value unless it is backed up by a real periapical or gingival disease existing outside of the tooth, and for such disease there is no remedy but surgery. The dentist, therefore, as much as the medical man, should be rid of such disease to save the rest of the denture, as well as the patient's health.

The dentist, the patient, and certainly the physician, in examining the teeth and tissues as shown tonight after operation will all agree that such filthy things should be removed as a routine hygienic precaution, whether they cause distant disease or not. But how about cases where the radiograph is indefinite, with the pulpless roots well filled? I should say, if the radiograph, repeated at intervals, shows no destruction beyond the tooth—which of course must be clinically checked, for the radiograph does not show everything—if the lamina dura and peridental membrane be intact, then I should retain such a tooth under clinical and radiographic observation.

I certainly want to congratulate Dr. Mead on the slides, and I only wish I were as sure of my pathology, both local and general, as he is.

Dr. Taylor. I would like to make a few remarks on the paper. This is the first time I ever saw Dr. Mead's films presented on the screen, and I must say that on the whole, from what I have seen in my experience, they are the clearest of all. Fortunately he has been doing my work for the past five years, practically ever since he began, and I have never received from him anything but the same excellent pictures that you have seen on the screen. He can bring out anything that is in the film by the technique that he uses, things that the ordinary radiographer cannot bring out. In regard to the diagnosis I would much rather trust that to him than to the medical profession. I have had a great many radiographs of all kinds of teeth, and all kinds of conditions, from the very best radiographers in Washington, and they are men of the medical profession, but I want to tell you that their films do not compare with these. They have not had the experience of the dental surgeon. I would not trust any one of them with the diagnosis; I would much prefer to make the diagnosis myself, but I find in cases sent to Dr. Mead I can depend on his diagnosis.

There are one or two points I would like to bring out in regard to some of the mistakes made in this work;—one

particularly in the mouths of children, or persons between the ages of twelve to sixteen years, where the teeth are not fully formed. If you have noticed in these pictures you will see the same character of area that you will see where there has been infection; so that we cannot trust to the radiograph alone in the diagnosis of these cases. We must test the teeth for vitality.

In some cases of pyorrhea, where the condition is advanced, there is slight irritation with numerous small pockets. These pockets are not shown by the radiograph, and many of the medical profession will give the patient a clean bill of health, but when clinical examination is made you will see numerous pockets there with pus in them such as might account for a systemic infection. Another point they overlook is the fact that where the teeth are placed under extraordinary stress there is more or less absorption of the bone or rarefaction of the bone, which shows in the picture as a darkened area. Medical men very often claim that the tissues are infiltrated with pus, with necrosis going on, and therefore the tooth must be extracted, whereas such is not the case at all. I had one case of pyorrhea sent to me where the entire lower jaw was affected. The physician who took the picture or radiograph was supposed to be an expert diagnostician, and he recommended that every tooth in the lower jaw be removed. I found that the man was one who worked about eighteen hours a day. He did have some pyorrhea, but he would grit his teeth in his sleep and while at work, placing an extra amount of strain on them, and I believe that was the cause of this picture showing—as the physician had supposed—a condition of infiltration of pus and necrosis.

I want to thank Dr. Mead for the concise manner in which he delivered his lecture, and also would like to have him demonstrate, before he goes away, his method of taking these stereoscopic pictures.

Dr. Baisch. I was very much impressed with the clearness of these pictures, and I must say they are the best

I have ever seen. I would like to hear more of the detail.

As to the physician making a diagnosis of dental conditions, I think we ought to stand up as a body and refuse to receive their diagnoses. I have had experience with physicians making diagnoses that were absolutely incorrect. Many teeth are ruthlessly sacrificed just because of such incorrect diagnoses, and I think we ought to reject them.

Dr. Kelsey. I do not think Dr. Baisch means just exactly what he says when he proposes that we should refuse the diagnoses of the medical profession. I can hardly believe he means just that. I think we are greatly indebted to them, and we should take a broader view than that. I consider their opinion invaluable to the dentist, although we should not perhaps accept it as final; it should be corroborated by ours, or ours corroborated by theirs, but that we should get a diagnosis out of the two opinions is beyond doubt. I think we have gained a great deal from the medical profession on this subject, and I believe Dr. Baisch thinks the same way, only he did not express it that way.

Dr. V. B. Ames. In regard to accepting physicians' diagnoses I suppose it is very necessary that we should consider them to a certain extent, but I have two cases in my office now where physicians have diagnosed cases sent to them, and have had them sent to me for extractions, and in one case there is no tooth to be extracted; in the other there is a gold crown on a canine, but as far as I can see it is clear, so I think he has made the wrong diagnosis there. A physician was treating one of my patients for high blood pressure, and he told him if he did not have a certain tooth extracted he would not attend him. He came to me, and I examined the tooth. He said, "Will you extract it if I bring you a picture of it?" I said, "I will if the picture shows it is affected in any way; otherwise not." He brought the picture and it showed that the tooth was all right. So you see we should not extract on a physician's diagnosis entirely.

Dr. Harris. It seems to me it is the office of the practitioner to save rather

than destroy, and it is very interesting to see pictures taken six or twelve months after work is done to see whether there is really new bone development, and whether we have been justified in saving those teeth. That to my mind is one of the principal uses of the radiograph.

Dr. Mead (closing the discussion). I appreciate very much the kind way in which you have accepted my lecture. I appreciate greatly what Dr. Grieves has said with regard to the relationship of the teeth to systemic disorders, and it may be that I have not made myself clear. I am very enthusiastic about the teeth causing systemic trouble, as I know they do. I see instances of it all the time. On the other hand, I see daily cases of all kinds of systemic disorders which have no relation to the teeth. I see many cases of systemic trouble where the teeth are vital, and absolutely perfect. But I am suspicious about every chronic systemic disorder, and I want to check it up and see if it is due to the teeth. Where we have a case of systemic disturbance, and find dead teeth in the mouth, we should not simply jump to the conclusion that they are causing the trouble. There are those who extract every dead tooth whether it is giving trouble or not. I think that is entirely wrong. There are plenty of dead teeth that have been and will still serve as good useful teeth, and we should use good judgment in sacrificing teeth. But where teeth are causing trouble, we should be sure to eliminate the focus of infection.

The next item on the program was a paper by **Dr. J. A. Furfey**, Boston, Mass., entitled "The Relative Value of Gold Foil as a Filling Material."

[This paper is printed in full at page 971 of the present issue of the DENTAL COSMOS.]

DISCUSSION.

Dr. A. C. Brewer, Baltimore. Of course the virtue of the gold foil filling as compared to the gold inlay is a matter of personal equation, as Dr. Furfey

has said. After observing my gold inlays for twelve years, I must say that I can find the same fault with gold inlays that Dr. Furfey does—I do not know whether the fault is in the gold or the wax; but, looking back, I can see my foil fillings intact. That gold foil contributes to tooth conservation goes without saying, and I will say the best work I have seen in my lifetime has been work done along the lines Dr. Furfey has spoken of in his excellent paper. I do not think we have improved upon it by the use of gold inlays. I have nothing to add to what the doctor has said this evening.

Dr. W. W. Dunbracco, Baltimore. It is very refreshing to have a gentleman come here and tell us after twenty-four years' experience that he is still enthusiastic in doing gold foil work. I personally do not think the inlay has any great advantage over the foil filling. Some of us, of course, have better technique in handling these inlays. In many places I think they are far superior to the foil filling, but in the bicuspid teeth, as outlined by Dr. Furfey, I personally get better results from the foil filling. Just what kind of people there are up in Boston, and whether they differ so much from our people, I do not know, but one reason the Baltimoreans do so much inlay work, I think, is because our patients will not sit in our chairs for an hour or two at a time, when their friends can go to the dentist and be through in so short a time. They say, "Doctor, it is awful to put me through this." The rubber dam is still essential in my office, but there are certain cavities that I fill with the foil rather than the inlay. In these large cavities I am perfectly satisfied to use the cast filling; but in the bicuspids, at that cervical border, I feel safer when I have packed such cavities with foil.

Dr. H. P. Cobey, Washington. I was unfortunate in not hearing all of Dr. Furfey's paper. The part I did hear was in support of the gold foil filling. I do not know whether he said anything in his paper condemning the inlay, more than that we had to do more extensive cutting to insert the inlay. I did hear

him object to the inlay because of the lack of adaptation at the gingival border. If the inlay is to be condemned for what the doctor has observed at that point, I think to be perfectly fair to the inlay we would have to condemn the technique rather than the inlay. I believe it is possible to adapt an inlay to that border as effectively and as securely as we can to any other portion of the cavity, if the proper technique is pursued. I am not in favor of condemning the inlay where failures result from improper technique. Of course, those of us who have used the gold foil, and have seen fillings that we inserted years ago still intact—I can go back a few years, and am proud to say they stand today, and if I live to see the inlays twenty years hence, I expect to see them averaging up just as well—so that I do not think the inlay is such a bad filling after all. The foil filling has its bad features, which have been referred to, calling for sometimes hours of pounding, and the pulp may be jeopardized sometimes with extensive cutting. I am not altogether sure that it is not injured by prolonged filing and hammering. I think each filling has its good points, and am also equally sure that each filling has its bad points. So that in deciding which method of filling we ought to pursue we have to consider other points besides those that have been mentioned up to this time.

Then, when we chose between inlays and gold foil fillings, if we consider the welfare of the patient, we have to take into consideration the ability of the average man or woman to endure the filling operation. It has been my observation that a dentist of average ability will make a better inlay than a foil filling, and I believe the essayist will admit that a foil filling which does not seal the cavity is a filling which will result in early failure. For some reason, which I will not undertake to explain at this time, it does seem that an inlay that does not fit perfectly will prevent decay. I am not saying that this is true to such an extent that we can afford to be careless of the insertion of our inlays.

That is something we cannot take liberties with at all; we should use every effort to make as perfect a joint between the inlay and the cavity as possible. So in choosing between filling materials I think we should exercise judgment, and consider the peculiar conditions in the individual case. I use both the foil and the inlay fillings; I have not yet given up my foil fillings entirely.

Dr. Furfey. Gentlemen, those teeth that you are passing around can all be taken out of the sockets and examined. All those teeth have been subjected to 280 lb. pressure.

The advantage of the hand mallet over the mechanical mallet is very obvious. Hand malleting is the force I use, and I consider it the best, after having tried every method.

Dr. R. R. Byrnes, Richmond, Va. It is very refreshing to me if I may be permitted to express a personal like or dislike in the premises, to hear somebody get up and defend the gold filling. I am a teacher, and one of the things I teach is the technique of inserting a gold filling. I told Dr. Kelsey a moment ago, I promised a friend who represents one of our journals that some day I would write an article defending the gold filling as against the inlay. If I were to sum it up in one phrase I should say the inlay, in many instances, represents the line of least resistance.

I think after this most excellent article of our essayist tonight I am relieved of that long-standing promise to my friend, because I am quite sure this paper will appear and largely express my views. I do not quite agree with the essayist in regard to cavity preparation. I am somewhat of a crank on that, gentlemen, I have to admit. That is my specialty, if I have one. But so far as the filling itself and the merits of it are concerned, I want to subscribe unreservedly my indorsement of the value of the gold filling. To my notion the *good* gold filling is the very best restoration that can be made in the mouth. It is the only restoration that takes advantage of the resilience of the dentin, which I am sure our essayist has not had time to men-

tion, as he says there are a few thousand things he could bring up to strengthen his case if he had time. I wish we had more of the gold fillings. The gold inlays are serving a wonderful purpose, but I hope that the signs of the times are wrong in indicating that the gold filling is being discarded.

Dr. Furfey (closing the discussion), In using the gold foil filling, I never in my practice of twenty-four years struck a blow with a mallet unless I stepped back thus [indicating]. When you have a child that is nervous and high strung, you must get his friendship, and you must get him to believe in you, and when he believes in you, you can get him to do what you wish with very little coaxing, and that is where I get my best work in. With the mothers and fathers it is a different thing. I feel that if I can't, I can't.

I prepare cavities taking away a little bit of dentin at a time. It might take four or five hours. As a rule my patients are all of high class, so that I cannot show any gold, and I carry it to the finest line, but I do try to get as ideal a cavity preparation as I can. I fall short sometimes, of course; if I do not practice extension for prevention there is no success in using gold. I use amalgam for that reason on younger people. If it gives out we have not lost anything.

I am also a teacher, and the students nowadays all take to the short cuts. They are afraid of hard work. Gold work is hard—but it is the same in everything.

As to what has been said about inlays, certainly they have their use, and a good inlay is all right. If we have an inlay that shows it is cemented, that inlay is only as strong as the cement,

and that inlay is going to give out if the cement gives out. The perfect inlay is a mighty hard thing to get. It requires very careful technique, and it takes a great deal of time before you get it satisfactory. I use them; I have to use them, but I do not use them where I can use the gold foil filling. Never!

It is easy enough for an operator getting from \$15 to \$25 an hour for his work to spend five or ten hours on an inlay, and get \$100 or \$200 for it. I know some men in New York getting that. One I know because he charged some of my people that. But the average dentist does not get \$15 to \$25 an hour for his work, and you have to consider that. He is not going to lose money. Some men will take a whole day to do a piece of work if they do not get 15 cents for it. The best dentist is the little fellow who does not get paid. The vilest man is the man in our big city who does poor work and gets good pay for it. If a man can get paid it is different, but there are lots of inlays that are "pretty nearly" right and they only hold for a while. Somebody is going to get on to this after a while—somebody outside of the profession.

With regard to the rubber dam: The main purpose of the rubber dam is the lip protection, and to enable you to see what you are doing. You have only one back, and when you die the patient will go somewhere else. Patients will say, "When you die I will have all my teeth out;" but they don't, they go somewhere else. If a man cannot make a perfect inlay, there are other materials which he can use. The amalgam filling is not nearly as poor as a poor foil filling or a poor inlay.

(To be continued.)

Missouri State Dental Association

Annual Meeting, St. Louis, Mo., April 14, 15, and 16, 1919.

MONDAY—Afternoon Session.

The association convened in general session on Monday, April 14th, in the Hotel Statler, St. Louis, at 1 p.m. with Dr. H. F. D'Oench, St. Louis, president, in the chair.

THE PRESIDENT. *Fellow-students and fellow-educators*.—Just a few years ago, men of our profession were so deeply engaged in working out problems in our small nine-by-eight operating rooms that we had no time to get out and be a factor of humanity outside. We were isolated from the rest of the people in the community because we were just mechanics, and we were staying in our offices, working out our adolescence as a profession.

In recent years we have grown in every direction to such an extent that the walls could no longer contain us. A few years ago we thought we could treat the people of the community, but we have since discovered that if the people who require our services would come in we would be simply annihilated. We know now that we cannot possibly render service to the community requiring our service. In the year 1900 there were five thousand dentists graduated; the number lessened each year until 1913, when but thirteen hundred dentists graduated in the United States.

We know that but five hundred patients per year can be cared for by any one individual dentist, and, realizing our limitations, we have taken on propaganda work of dentistry, and we want to carry out a conservation program—one for prevention rather than cure. Since we were challenged by Dr. Mayo of Rochester, Minn., to take the next great

step in preventive medicine, we have steadily attempted to work in that direction.

One method of educating the public in preventive dentistry has been the dental clinic, the free dental clinic. To my mind, the chief value of the dental clinic is its educational value, and not the reparative work done for a limited number of people. Locally we have been very fortunate in having a broad-gage group of men who have seen the value to the community of a clinic, and through their generous co-operation we have a small clinic in our city. A large part of the success of this clinic is due to the open-mindedness and strong co-operation of the chief of the department of Hygiene of the board of education. I refer to Dr. James Stewart, who will speak to us on the need of greater dental clinics.

DR. JAMES STEWART, St. Louis. *Mr. President, ladies and gentlemen of the Missouri State Dental Association*.—I am very glad indeed to have this opportunity to say to this organization that if it had not been for the constant efforts of your worthy president and some of his colleagues, we would yet be minus a dental clinic. As Dr. Gulick said many years ago, children of school age lose more time from school attendance because of dental conditions than from any other cause. We felt the great need of this educational campaign, and the special value of the impression on the school children in a dental clinic.

Upon hearing your worthy president say that but few people are graduating as dentists throughout the states, I do not see how, after we do conduct and carry on this campaign, we will be able

to continue the relief work, and with that, the educational work.

We have a little clinic established in the city of St. Louis that is operated under the auspices of the St. Louis Dental Society, and financially maintained through the kindness of one of our good citizens, Mr. Geo. A. Meyer. From the efforts and results of that clinic we are anxious that it shall be continued, that it shall be enlarged, not only in the city of St. Louis but throughout all the rural districts of the state, so that there may be established free dental clinics in all the school districts for this educational work.

I speak from the standpoint of the country physician; I practiced up in the state for ten years, and I know the need of dental relief throughout the rural districts as well as in the city of St. Louis or any other city. In New York and Boston, you know the success they have had with the clinics, and in Rochester, N. Y., we have another large clinic, and also elsewhere through the states. I feel that through the efforts of your organization, through the efforts of the local society, we ought to work and we ought to so educate the masses that we shall have no trouble in establishing a clinic in every hamlet in the State of Missouri.

You know, while you are educating these children you are educating the adult. We, the school authorities, claim and know that the results gotten through this work in the dental clinic are such that it is an economy to the taxpayer and an appeal to his pocket. We know that these children lose the time in the classroom, but by removing dental troubles the youngsters will be able to accept the instruction that is given to them by the teachers with the least possible effort on their part and the least possible effort on the part of the teacher. Therefore, starting in the kindergarten and finishing in the eighth grade, there is a saving, not only to his physical make-up, but a saving to the city in his educational standing.

Now, we feel that there is no need of putting statistics to you men; you know what it means. What we want to do is

to enlarge this work throughout the land, and I am sure the board of education of the city of St. Louis will be only too glad to co-operate with the dental profession; and I am happy to say that even the negroes of this city have gathered up enough money to establish a negro clinic; so you see we are growing, and we expect to continue to grow. We know the great value of it, and we hope that the people throughout the state will profit by the experience of the St. Louis people. I thank you.

THE PRESIDENT. Speaking of education, we are trying to gain an education by attending this meeting. I want to remind you of the fact that St. Louis stands pre-eminent among the school systems of the entire United States as the best organized, the best conducted, and as turning out the best product of any city in the United States.

Our board of education, during my lifetime, has always been fortunate in selecting men to educate our children who have been pre-eminent in their work. The present superintendent of instruction of our schools stands pre-eminent among educators, and we are indeed fortunate to have him with us today to discuss the educational value of the dental clinic. I take great pleasure in introducing Dr. John W. Withers, our superintendent.

The Dental Clinic and the Public Schools.

DR. JOHN W. WITHERS, St. Louis. *Ladies and gentlemen*.—I certainly appreciate very much indeed the kind introduction of your chairman. I think, however, that he is mistaken. I asked him to allow me to speak second instead of first on this program, as I wanted to find out if Dr. Stewart would say what he should say. I think he made a good speech, so I haven't anything to complain of.

I am very deeply interested in this work of the establishment of dental clinics, and think I have some very good reasons for being so interested. Of course, we naturally date everything nowadays from the beginning and ending

of the late war, and we do that because the late war helped us to realize and to understand a number of things about ourselves, about our educational system, that we were not fully conscious of before.

Among those things was, of course, the realization by the people at large, as well as by the medical profession, of the fact that as a nation we were not as strong and healthy physically as we ought to be. We were all of us very much startled and surprised when we realized that some thirty-five per cent. of the young manhood of the country called into the service of the country were not able to serve in that capacity, for the reason that they were physically unable to do so. This physical disability, in some eighty or ninety per cent. of the cases, was such that if it had been taken care of in time it would have been possible for these men to have served their country in the army, and done so safely, as far as their health was concerned.

Realizing that we had a great big problem in educational reconstruction before us, some of the members of national organizations of educators appointed committees to come together and study the problem of national education. We called it the "Reconstruction Committee" and the "War Emergency Committee." I had the good fortune and the pleasure of being a member of the committee of the National department of Superintendents, and was also given the position on that committee of chairman of the sub-committee on "Health Education in America," and very naturally the study it was necessary for me to make has opened my eyes to a great many things that I before did not realize. I shall tell you in a moment the results of that committee's work.

I want to digress for just a minute to call your attention to the fact that we are not thinking of education today as we thought of it a few years ago. The time was, and it is not far distant, when we thought the only function of education was that of instruction; we felt that the business of the school was to take the

child and bring to the mind of that child during his school life, in proper form for his instruction, those experiences of his own childhood and adulthood that he would need to know in order that he might take his place as an adult member of society later on. In other words, we felt the one business of the school was to teach him something selected from the experiences of the past history of the race, organize those experiences, commit them to textbook form, and train teachers to instruct so that these children might enter into the possession of their inheritance as people, that they might make use of them in meeting the needs of their own life when they became men and women. That was our fundamental conception, and the only conception we had.

Today we are thinking of the school as having a threefold function. We are thinking of it, first of all, as a protective institution, a conservative institution; in the second place as an educational institution; and we are now thinking of it as a selective institution, or having a selective function. In connection with those three functions I want to speak to you, as dentists, of the first, the school as a protective and a conservative agency. We are only recently becoming aware of the fact that that is a part of our business. The idea has grown, it has developed rather unconsciously among us, and today we are becoming conscious of it, and trying to further that development in a very conscious way.

You can see the things we have done in the conservation of the child. First of all, in looking at our own school system, the establishment of an attendance department to see that the child is given an opportunity to take advantage of that institution which is provided for that purpose—for his education in the community; in other words, that the child may take advantage of his rights and privileges as a prospective American citizen. The school can be made democratic, so that we have our attendance department to see that he attends school during the time he should. There we find, in the conservation of the child,

that that institution, or department of public education, has accomplished a great result. We have kept our children in school, they have taken advantage of the opportunities in the case of homes that did not appreciate the value of the school sufficiently to see to it that the children were kept in school.

We have had a hygienic department. We must see to it that the children are not only in school, but that while they are in school they are in a position to take advantage of what it offers. If a child is in school and we are paying the expense of operating that institution and furnishing him a good teacher, and he is not fit to take advantage of what we offer, the public is deprived of what it ought to have—is paying for something it is not getting. We cannot have in the school a child who is sick, a child who is not in physical condition to give careful attention to what is being done. It is impossible for anyone to concentrate his energy upon something when he is physically uncomfortable, when the ventilation is not what it ought to be, when the heating and lighting and environment are not what they should be. So we have our hygienic department in connection with our public school system, to control conditions, as far as possible, to make it possible for every child to take as full advantage as he can of the opportunities that the community provides for him in the way of schooling.

Not only is that true, but we have several other movements that have been on foot in recent years to guarantee the child that he has an equal opportunity with every other boy and girl to take advantage of his right to an education. We have, of course, the compulsory education law established, and the gradual extension of the time limit to give him larger and larger opportunities to take advantage of such facilities as the school may offer for his education. The dental clinic is one of these institutions—and a very important one, for the reasons, better known to you than to me, already mentioned by Dr. Stewart.

I will come back for just a moment to the committee that I spoke of a

moment ago, the committee of the National Educational Association, co-operating with some sixteen other societies. As a result of the study of these committees, the chief committee has found expression in a bill that was introduced in Congress the last session, known as the Smith-Towner bill; first introduced by Senator Smith and later in the House by Congressman Towner of Iowa. The bill was introduced to provide federal money for education. It is taking hold of the proposition, and bringing to the attention of the people a new movement in education, one that we ought to notice and give our full support.

Some do not understand the bill, and have shown some disposition to oppose it. I generally put the matter to myself in this way, and sometimes to persons to whom I try to explain it—that we have had in America, in our educational system, what may be spoken of as “educational nullification.” You remember the principle of nullification was fought out by Lincoln and Douglas in their famous debate. What I mean is this: We have been saying in the past that a state or city or town may be as much or as little as the state or city or town is willing to pay for; the rest of the public is not very much concerned about it. Now, we overlook in that the fact that any person, by virtue of the fact that he is a resident of the city, let us say that he is a citizen of St. Louis, has rights and privileges that belong to him as a citizen, he has duties and obligations that he must discharge to his fellow man. We have recognized that in the past, and we have said that that man, if he is going to take full advantage of his rights and privileges, if he is going to do his full duty and measure up to his responsibilities, must be educated for that purpose. If he owes those things, the public owes it to him to see that he is properly equipped to take his place as a citizen of the community. So we have said to ourselves, “Yes, in cities and towns we will tax everybody, whether they have children or not, in order to provide public school education for all

the children in that city or town." We have done it because we say that this man, although he has no children, is interested in the way these young people are going to live, in the way they are going to take advantage of their opportunities to build up that town. So we have justified popular education in that way.

We have said that a person living in Missouri, by virtue of the fact, has certain rights, certain opportunities, and certain privileges along with the obligations that go with the fact that he is a citizen of Missouri, and Missouri, therefore, owes it to itself and to him to make it possible for him to take the fullest advantage of his opportunities and meet the obligations in the best way. So we have said, "We will tax Missouri to meet these obligations." We have not done it very heavily, but there we have stopped.

In the past we have said that the states may do what they please in the matter of education, the cities and towns may do what they please, further than that, we, living in other states, have no more concern about it. We are beginning to realize that a man who is a resident, a prospective citizen of the United States, has certain very important rights and certain great opportunities that we ought to value as a nation, and also the corresponding obligations and responsibilities as an American citizen that he would not have as a citizen of another nation. Therefore we have a right to see that he is so trained that he will be a unit in the population, in the nation, that will measure up to the opportunities that he has had; in other words, that he will be the biggest man that it is possible to make him. Therefore, we are recognizing in this bill, and we are coming to recognize it in other ways, that the nation has a responsibility in the education of its citizens. With that in mind, we have introduced this bill, and we believe it is going to pass the next Congress. If it does, the time will soon be here when you will have your dental clinics at public expense.

Let me explain to you what I mean: This bill provides, of course along with

other things, a National Department of Education, along with agriculture and the other activities. We will have a Secretary of Education, if the bill becomes a law, and that secretary of education will have certain duties and responsibilities for the promotion of education throughout the states as a whole. He will have a representative connected with the consulates of the United States Government in other countries, reporting constantly back to the United States anything that we ought to know about here in America—keeping us right up to the minute as education develops among ourselves and throughout the world. We need that, and I cannot describe all the advantages that it will bring. The important thing to us, however, is that the bill provides for the expenditure annually of federal funds amounting to one hundred million dollars. One hundred million dollars is a considerable sum, we all know, and especially when spent on elementary and secondary education, on condition that every state that takes advantage of this federal act will match dollars with the federal government in promoting this educational concern.

This may be somewhat off the subject, but I want to speak to you people on this. I want you to realize, my friends, that we have twenty-three million youngsters that have the hardest problem before them in the next twenty years that any generation of American citizens ever has been called to face. We are starting a Liberty loan next week; we have had several Liberty loans, and what we are doing is saddling upon these youngsters in the schools that national debt which they will have to pay, and they will have to pay it under conditions which no generation has ever had to face before. We must educate those boys and capitalize their responsibilities so they will be fifty per cent. more efficient, and they must be physically and mentally fit.

We have, teaching those twenty-three million youngsters, about 600,000 teachers, mostly girls, 100,000 under twenty years of age, 150,000 of whom have taught less than two years, and 200,000

of whom have not had a high-school education; the rest of them have had some normal school and college education. They are teaching our children for \$643 a year—and scrubwomen in the national navy yards are paid more than that. Are we content to put children's physical well-being in charge of people who have not had any more training than that? I say, "No." If we do, we shall make a great big mistake as American people.

Now, take your one hundred million dollars. Twenty millions of that money will be spent on physical education, twenty millions of federal money plus twenty millions of state money will be spent on education in health, and along with that will be not only your department of Hygiene, but your dental clinic as a part of your department of Hygiene and connected with it. We will have this opportunity if we can only get behind this bill and put it through.

I think, Mr. Chairman, that the way is open, and the prospects are bright for the establishment of dental clinics, not only one or two in St. Louis, but several in St. Louis and other parts of the State of Missouri within the next three or four years, and especially so if we can make this bill become a law. If we can get the intelligent public back of it, what you are striving for as intelligent people of the country, the great value to the child that can come from this sort of thing is at least possible of realization, and prospectively will be realized in a very short time.

Now, as has been said by Dr. D'Oench, the chief value is not in the repair work, it is in the educational work, in educating the child to what it means to take care of his teeth, and if all the other children are like my own they bring things home and open your eyes to some things that possibly you did not realize before. Any kind of education that you can bring about in early childhood is worth hour per hour five times as much as that brought to bear on an adult. The reason is, that the education you get in early life goes below the intellect, it has an influence in determining how you

look at things, how you value the experiences of life.

The poorest piece of work we ever did was that started by the Women's Christian Temperance Union, requiring that scientific temperance, so called, should be taught in schools. I know that I can make the confession that that was the poorest piece of work we ever did. The reason was that we did not understand scientific temperance; the teachers or doctors did not know very much about it. But what really did happen was that that thing was brought up in the school with the little children, and they got the impression that liquor is a bad thing, that it is not good for people to drink. You go back in American education, and you will see the effect of that kind of education. It is there. Has it ever occurred to you, that in recent years there has been a tremendous change in reference to prohibition? Go back, and see how long it has been since that thing was started in public schools. Those boys are now voters at the polls, and many could not tell you why they favor prohibition, but they simply vote the way they feel.

Let me tell you something on myself. When I was a boy in the State of West Virginia, we did not have very much dancing; we lived out in the country, and, thank Heaven! I had a good mother. Out there in the country when we did have dances they were platform dances on the Fourth of July, and they drank a lot of whisky and had a violin, and there were several fights. So my mother, when I was a little boy, used to take my hand, and say, "I hope when you get to be a man you won't have anything to do with that kind of thing." And now this is my confession: I have grown to manhood, I have gotten a college and university education, I have seen dances and I value them as physical exercise, but if you were to come into my home and say, "Let's take the chairs out and have a dance," I would feel funny about it. Why? Because right down in the very heart and core there is still the effect of that mother's teaching.

Now, whatever you can do in the way of teaching a child the importance of taking care of his teeth when he is a little child, and "get it home," you can depend upon it as having a permanent value, and as being of permanent worth in his after life. I thank you.

THE PRESIDENT. Our next speaker has requested that I cut my preamble in her favor. She evidently does not approve of the way in which I introduce speakers. I am going to introduce her simply as an intelligent mother who appreciates motherhood as a sacred part of her life—so much so that she wants all other mothers' children to get the best possible service for physical and mental welfare that the state affords.

This lady has been extremely active with the Women's Council of National Defense; she had charge of the Bureau of Public Information. She compiled a lecture on Oral Hygiene which we indorsed, and sent out, with the sanction of the Missouri State Dental Association. Twenty-two thousand copies of this lecture were distributed to the school teachers of Missouri by Mrs. Lon Hocker, our guest.

Mrs. LON O. HOCKER, St. Louis. I wanted to stand on a chair so that I could see all of you. I do not care a bit whether you see me or not, but I would like to have you hear me, because this talk, which I went to a great deal of trouble to write out so that it should be exactly right, is really useless after all the things that Dr. Withers and Dr. Stewart have been saying to you. But, at the same time, the message is in my heart, and I want to get it over to you. I feel terribly embarrassed to address a body of such intelligent, earnest men as you are today, knowing so little about the profession as I do; but I am a friend of children, as I am sure all of you are in this room, and as a friend of children I may have a few thoughts that may be worth while to you to carry home.

It would be perfectly wonderful if this scheme of the education of the country

is carried through. I am sure no one would be happier than the dentists, but in case it is not to go through, or in preparation that it should go through, I have a few things that I would like to say to you. Then I would like to add right here what I heard Roosevelt say once that made a tremendous impression on me, that we can go and listen and be thrilled, and say, "Hip! hooray!" and throw our hats in the air, and applaud, but if it stops there we might just as well have stayed at home. It is the fellow who can put into life and carry out what he has really had in mind to do—make the "hip! hooray!" go into actual activity—that helps humanity.

Now, back to a few little things that might show you why I have this interest in your profession. Probably you know, as Dr. Withers has said, that we were tremendously astounded when we found out the health conditions of our young boys in the draft. That worked itself into an investigation of the health conditions in our country, because of conditions found in England, and we discovered that three hundred thousand little American lives are wiped out every year in our United States. Did you gentlemen know that? I do not believe a lot of us did. Every year three hundred thousand babies die in the United States. In our great State of Missouri there are ten thousand of them die every year. I wonder what the good business men of our state would do if ten thousand of our cattle or pigs or chickens were to be wiped out with a scourge? They would get awfully busy with the Agriculture department to cure it.

Well, the Children's bureau did make an effort to see if they could not reduce this mortality. They asked the Council of Defense to do something toward that end. As I was working in the Council of Defense, I went to our baby specialists, and asked them what could be done about it, why it was, and everywhere I got one answer, "Ignorance, ignorance, ignorance!" Ignorance of the simple rules of hygiene. Well, I simply shadowed those baby specialists until I got them to lay down a few rules on general

health, hygiene, the "do's and dont's for mothers, for babies." We got those rules compiled, we published them in all the daily papers, and the editors were wonderfully helpful. You can tell your editor in your home town that Mrs. Lon Hocker is a booster for him. I never saw such wonderful co-operation; they wrote back to me, and said, "Send us your propaganda, and we will publish all of it."

We put these things in every place we could to educate mothers to keep their babies from dying of summer complaint, keep them from having scarlet fever, trying to help them, and entirely forgetting that one of the greatest menaces to the health of the child was a dirty mouth. I never discovered that until I brought my children home and took them to the dentist to have their mouths cleaned, and then it dawned on me. Good fortune brought me to your worthy president, and through his co-operation, and that of Dr. Kennerly, Dr. Hagemann, and one or two others, we compiled this dental chart, which I wish every one of you would take back to your home town. We had those published, we sent them to every school teacher in the State of Missouri whose address we could get, and we put a letter in asking them to bring it to the attention of the child, and institute school toothbrush drills.

The thing I am bringing to you here today is that the health of the child is dependent largely upon the cleanly condition of his mouth, and if the parents do not know this you must educate the children in order to educate the parents. When I went to Dr. D'Oench I learned, in about ten minutes, more about oral conditions than I ever knew before, and I imagine that is the experience of all of you dentists with the mothers with whom you come in contact.

Who is going to educate these mothers? Who is going to tell them that the health of their child is dependent upon the condition of his mouth? I say the answer is right here. *You* are going to tell them. Every man here is a dynamic force to arouse enthusiasm in his com-

munity that a clean mouth makes for good health, and a dirty mouth makes for poor health, among children.

Now, no lightning is going to strike in your community; I do not believe any man is going to walk up to you and say, "Here is \$1000, or \$5000, to start this dental clinic"; nor is anyone going to start any enthusiasm for the care of the mouth unless it is the man who has it at heart, the man who knows about it; who can do it half so well?

It seems to me that every man would like, besides earning a living and making a success of his profession, to do something besides just that, to do something for others. This war has taught us that it is very nice to do for others, to give. I am reminded of that story of Roosevelt, which you probably know, when this wonderful boy Kermit said something about the poor little boy that lived two blocks away. Roosevelt said, "My son, there are just four kinds of boys in this world—good boys and bad boys, big boys and little boys—that is all." Isn't that a sweet story? Well, I say to you, gentlemen, that there are just two kinds of people in this world; those who know and those who do not know. I say that it is the duty of the man or the woman who has had the chance to know to tell the people who do not know. I say that you men should go back to your home towns, go to your board of education, to your men's clubs, to your business men's leagues, and say, "We want toothbrush drills in our schools here. I am perfectly willing to give you a lecture on the influence on health of clean mouths." Go to your women's clubs, and tell them they must teach their children to take care of baby teeth. You can do more for your community than any other one force.

The St. Louis Dental Clinic stands as a wonderful monument to the wonderful patience and untiring labor of your honored president, Dr. D'Oench. I hope that the love of children, which is a common bond between us all, will make for an inspiration to and a health education for the children of our state. I hope I may live to see a dental clinic in every

important town in the State of Missouri that is represented here in this room.

THE PRESIDENT. Did you see Mrs. Hocker? I feel that she has delivered her message. I want to remind you of the fact that the afternoon lecture clinics will begin in five minutes, and that tonight at eight o'clock an extra lecture clinic will be given by Dr. Maves of Minneapolis.

Adjourned until Tuesday afternoon.

TUESDAY—Afternoon Session.

The meeting convened at 4.30 P.M., Dr. H. F. D'Oench, president of the society, in the chair.

The secretary, Dr. Wallace, read the minutes of the previous meeting.

THE PRESIDENT. If there is no objection, the minutes will stand approved as read. (No objection entered). As we have a general session in the morning, and in order to expedite the business of the afternoon, we shall proceed at once to the immediate business at hand, which is the election of officers for the next year.

I want to say that the attendance at this meeting we believe to be unprecedented in the history of our association, the total number registered up to five o'clock this evening was 692. The highest previous to that was 500.

We have with us today Major Brandenburg, who has requested five minutes of your time. We will grant him this five minutes while these ballots are being prepared and collected. I take pleasure in introducing Major Brandenburg.

MAJOR BRANDENBURG. *Mr. President, ladies and gentlemen,*—I did not ask for the time this afternoon, but was requested to come, and I was very glad to do so because the subject on which I wish to speak is one of common interest to both the dental and the medical profession. There was a time when a communion of interest between the two professions was nowhere near what it should be. Gradually the two professions have

been growing closer together, and one of the good effects that is to come out of the war—which has a few good effects, of course—is that the medical profession and the dental profession have come to know each other better, and I believe the public has come to know both better. The matter about which I wish to speak to you is one that relates to the venereal disease question. Ordinarily, and unfortunately generally, this has been a tabooed matter, but I feel I am justified in coming before you, because I know there is no one here whose experience has been so narrow that he does not know of a dental surgeon who has become innocently infected from a syphilitic patient. Such things are not common, but when they do occur it is deplorable, and there is no reason why we should not put our shoulders to the wheel to, if possible, prevent such conditions from occurring.

When the first draft was called for the army it was discovered that a large number of the men coming in were venereally infected, and the importance of the question very quickly made itself felt in Washington. Congress saw fit, in fact, was forced to the point of making a special appropriation to combat venereal diseases. This appropriation is distributed throughout the states, and I was appointed to handle the matter in the State of Missouri. I was very sorry to find that the state has a Board of Health in name only, having none of the powers that were necessary to qualify it to secure its share of the appropriation, and nothing has been done so far, although a year has passed. A bill has been introduced, one that refers specifically to venereal diseases, but I am sorry to say that the past attitude of the legislators has been to refuse to take the question of venereal diseases seriously. Two bills are before the Senate and the House which, if passed, will still enable the state Board of Health to comply with the requirements of the federal legislation, and bring this appropriation into the state to be used here.

I have come here with this purpose in view, to ask that you join with the

medical profession and with other agencies who are interested in public welfare to do something to let our legislators know that you, as a profession and individually, are personally deeply interested in the subject of this legislation. The bills I refer to are—and I would like to have all of you take these numbers down—Senate bill No. 675 and Senate bill No. 676. These bills will give the state, for the first time, a real Board of Health, and giving it that will give it an agency through whom the federal government will be able to disburse this money in accordance with the law. There is now available for this year the sum of \$35,800. It would be a pity to see that money revert back into the federal treasury, when there is lots of use for this money in the state.

I need not tell you about the dreadful ravages of this disease, and I know you are familiar with instances where friends have become infected by patients who were affected.

These bills, I learned, are to be voted on in the Senate tomorrow morning, and I would therefore suggest that those of you who feel deeply enough interested would telegraph tonight to your senator in Jefferson City, telling him that you are interested in Senate bills No. 675 and No. 676, and urging that he vote for them. Unless these bills are passed in this session, there will be no opportunity for two years, as you know. Who knows but you might be one of those who are saved from an infection by the passage of a bill now?

Furthermore, I would like to make this suggestion to show that the profession at large is interested: That you instruct your officers to send a telegram in the name of your association to the senators at Jefferson City, requesting them not only to vote for these bills, but to use their every effort to secure the passage of them.

I am sure this is a period of constructive legislation. Our federal Congress has been deeply engaged in the passage of legislation for destruction, but we have learned many a lesson in the last two years, the most important

being that life and health are two very important things, and I feel I am not appealing to you in vain.

I would be glad to hear that this association, Mr. President, is going to join the state medical association, the Council of National Defense, and the other welfare organizations, in impressing upon the legislators what they do not already feel. I am sorry it seems necessary to refer to it in that way, but it is unquestionably true that our legislators do not realize the seriousness and importance of this preventive work. I thank you.

Dr. McCUE. Mr. President, when the dental legislation was pending before the Missouri State Legislature, we found a number of men who belonged to the medical profession belonged to those committees, and they supported us in every measure. I think we should have a number of telegrams go into the Missouri chamber in the morning, asking the members to support Senate bills No. 675 and 676. I would like all who will send a message to their senators to rise. I make a motion that everybody be requested to send a telegram. (Motion carried.)

Dr. CAMPBELL. I move that we instruct our worthy secretary to send such a telegram to such senators as the doctor may indicate. I move also that we, as a convention, instruct our secretary to send this telegram approving of Senate bills No. 675 and 676.

The motion was duly seconded by Dr. Grosby, put, and unanimously carried.

ELECTION OF OFFICERS.

The association then proceeded to the election of officers for the ensuing year, which resulted as follows:

President—Dr. Chas. Digges, Columbia.

Vice-President—Dr. J. F. Wallace.

Members of House of Delegates—Drs. Allen, Rinehart, Kennerly, Harper, and McCue. *Alternates*—Drs. Haigh, Shelton, Keys, Mitchell, and McLellan.

THE PRESIDENT. Some time ago it developed that the dates of the meeting

of the Missouri State Dental Association and those of the Kansas State Dental Association were the same. We requested the Kansas association to change their dates, and this they most graciously consented to do, and wished it to be known that they did this as a matter of fraternal fellowship, good feeling for the dentists of Missouri, and as a courtesy to our association.

I informed them that we most heartily appreciated this fact, and that I would bring it to the attention of the Missouri State Dental Association at its first session. I would be pleased indeed to entertain a motion to the effect of an expression of our appreciation of this wonderful courtesy. As a member of your executive board in Missouri, I realized what a tremendous sacrifice this was on the part of the Kansas State Dental Association, coming as it did so shortly before the time of their meeting. I would like to hear the expression of this

association in regard to this action by the State of Kansas.

Dr. HAGEMANN. Mr. President, I move that a committee be appointed to draw up resolutions properly thanking the Kansas State Association for the courtesy shown in changing their dates in our behalf. I, too, have been working on the Executive Committee and realize what a sacrifice it has meant to them, and I feel full justice should be shown the Kansas association for this courtesy.

The motion was duly seconded and unanimously carried.

THE PRESIDENT. I will appoint on that committee Dr. H. F. Hagemann, St. Louis, Dr. McCrum, Springfield, and Dr. Lowry, Kansas City, to draft these resolutions.

If there is no further business, we will stand adjourned until Wednesday morning.

(To be continued.)

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDWARD C. KIRK, D.D.S., Sc.D., LL.D., *Editor.*

L. PIERCE ANTHONY, D.D.S., *Associate Editor.*

PUBLISHED BY THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Virgin Islands, Cuba, and Mexico. Canada, \$1.40. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the EDITOR, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, OCTOBER 1919.

EDITORIAL DEPARTMENT

Dental Education of the Public.

OUR esteemed contemporary *Oral Hygiene*, in its September issue, with characteristic verve and enthusiasm, appeals to the dental profession and its editorial colleagues to support a campaign which it has inaugurated for the education of the public in matters dental through the medium of the lay press. It says editorially:

You are asked to loyally support this magazine in its campaign of publicity to educate the laity. We have ardently wished for this service; now that it is at hand let us all co-operate to make it a grand success, that the people shall know and realize that the proper care of the teeth is an insurance against disease and will pay substantial dividends in increased health and efficiency.

The great war was fought and won for the sake of the children—the men and women of tomorrow. It is our duty to the child to

assure the best possible physical and economic surroundings, to provide every means of growth and development of a healthy and perfect body. While other factors enter into this field, nothing is of greater importance than the proper care and protection of the teeth and mouth of the rising generation.

The plan is to make available to the daily and weekly papers in the United States, through the medium of the McClure Newspaper Syndicate, carefully prepared articles of an educational character on the various aspects of oral hygiene and its health relations, to the end that the lay public shall develop a realization of the elemental importance of mouth hygiene as a general health factor.

The editor of *Oral Hygiene* in a personal letter appeals for the co-operation of the DENTAL COSMOS in support of this movement, which we are assured will be conducted upon strictly ethical lines. Dr. Belcher says in his letter:

We desire the co-operation of every dentist, of every dental society in the land, and of every dental journal. The object of this letter is to ask you to co-operate through your magazine in helping the dental profession secure this uplift.

It is the concluding sentence of the foregoing quotation that has particularly arrested our attention and suggested the following considerations.

We are asked to co-operate in a movement to educate the lay public in the importance of mouth hygiene. To this we gladly and unhesitatingly assent. The DENTAL COSMOS from the inception of the oral hygiene movement has assumed the rôle of protagonist and has always given to the propaganda such aid and furtherance as it was within the limits of its ability to render. We therefore gladly offer our co-operation in this proposed popular extension of the educational campaign organized by *Oral Hygiene*. Committed as we are by our policy of leadership for the past quarter of a century in giving furtherance and publicity to the gospel of sound teeth in a healthy mouth, we could do no less than to bear our share of the crusade until the goal is won.

But we are asked to "help the dental profession secure this uplift." Let us see for a moment just how that phase of the matter is going to work out.

One would suppose that a scheme for the education of the lay public in the care of the mouth and teeth as a health measure, would have for its main if not its only purpose the "uplift" of the lay public. If the plan proposed is to succeed, we submit that it can reach success on no other basis than through a realizing sense by those who undertake it that it is for the public welfare that the effort is made, that the uplift to be achieved is the uplift of humanity, and that any taint of selfish professional interest expressed or implied will be fatal to the attainment of the object.

The idea of an uplift for the dental profession is very frequently voiced in various ways in these latter days, and we are impelled to ask, What kind of an uplift does the dental profession require just now to better its condition and status as a profession?

In past years the cry was for "recognition," by which was meant recognition of the importance of its work, its achievement, its relation to the general health, its coequal status in so far as its service to humanity is concerned, with the other recognized specialties of the healing art. All of which has been abundantly conceded by the National Government, by the medical profession, and by the public at large, not only in America but generally throughout the civilized world. Moreover, the recognition of dentistry which has now come in such large degree is the direct result of the education of the public already accomplished by the various activities growing out of the oral hygiene propaganda;—the scientific and clinical data which have demonstrated the causal relation of the infected mouth to bodily disease, and the impetus given to the study of the vital health relationships of oral sepsis by such pronouncements as that of Sir William Hunter in his McGill University address. We offer for thoughtful consideration the fact that the public, at least a respectable proportion of it, is already educated to an understanding and appreciation of oral hygiene and the disastrous consequences of its neglect. Is it not true that the voice of "the public" is constantly raised in protest at the prevailing tendency to attribute a dental origin to every ill that flesh is heir to? And is it not also true that the present public demand for dental service is fully equal to the capacity of the dental profession to supply?

With these elemental conditions facing us, we submit that the

impending question to be solved is not the education of the lay public to an appreciation of the importance of dental service, but rather, Who is to do the work of rendering dental service to that portion of the lay public who are already educated to that point and are insistently demanding dental attention? In our effort to "uplift" the dental profession we have lengthened the course of dental educational preparation, we have increased the standard of preliminary education, we have tightened the defenses of our state laws against the admission to practice of incompetents—all of which has reduced the number of admissions to dental colleges. In short, we are strenuously attempting to increase the demand for dental service on the one hand, while on the other we have been and are carrying on a campaign which is reducing the proportionate output of men qualified to render the required service.

We feel that we hardly need reiterate the policy of the DENTAL COSMOS as related to the promotion of all that concerns the welfare of the dental profession—its record is open to inspection by all parties in interest; but just because of its policy in that respect, and because we believe that the dental interest of the public is in the final analysis also the interest of the dental profession, we contend that having educated the public to the need of dental service, it is the duty of the dental profession to adequately provide that service. Who is to do the work, if not the dental profession? If dentistry is to be a monopoly to be enjoyed by the favored few protected by legislation conceived and administered to conserve the selfish ends of a minority, what is to become of the demand for dental service which popular education of the laity will create—indeed, has already created?

One of two things must happen: Either the organized dental profession must provide the required service, or the state will have to open the way, as has already been done in Great Britain by reorganizing the whole dental professional system so as to adequately provide for public dental service.

We willingly accord our co-operation to *Oral Hygiene* in its scheme for educating the lay public. Will *Oral Hygiene* accord the DENTAL COSMOS its co-operation in the effort to educate the dental profession to a realization of its duty to render the public the dental service it will demand—is demanding, because of the educational oral hygiene movement? It is needless to say

that what we are contending for is not such an "uplift" as means added dollars to the annual dental income, but rather an extension of dental service to that large portion of the public who are bearing a burden of ill health and lowered efficiency from lack of proper dental treatment and ignorance of oral hygiene—a group whose demands must be met when they shall have been shown how to voice them, and whose needs must be supplied in a broad-minded spirit of altruism for the public good and welfare of the state, and not by a desire for private gain or the material uplift of the dental profession.

BIBLIOGRAPHICAL

TRANSACTIONS OF THE SIXTH INTERNATIONAL DENTAL CONGRESS—London, August 1914. Compiled and Edited by H. R. F. BROOKS. Published by the Committee of Organization, Hanover Sq., London, W., Eng.

The publication of the Transactions of the Sixth International Dental Congress has been much delayed by the world war which caused the abrupt and early termination of its proceedings, war being declared by several of the European countries during the week in which the Congress was being held. This momentous event not only prevented the attendance of hundreds of members, but curtailed the programs of the various sections. However, a large amount of

useful and important work was carried out, and the finished Transactions constitute a very creditable addition to the series of Congress Transactions already published.

Because of the serious handicap under which the Committee of Publication was compelled to work, the papers are published only in the language in which they were presented, the larger portion of them being in the English language.

Many of the original papers which were presented before the Congress have been published in full in the DENTAL COSMOS, and a greater number reviewed therein, but the complete Transactions of the Congress should be available to every member of the profession as constituting a valuable literary record of the status of dentistry in the year 1914.

Books Received.

Books received are acknowledged in this column, and such acknowledgment must be regarded as a sufficient return for the courtesy of the sender. Selections will be made for review in the interests of our readers and as space permits.

"Transactions of the National Dental Association," Twenty-second Annual Meeting, Chicago, Ill., August 1918. Published by the *Journal of the National Dental Association*, Chicago, Ill.

"Orthodontia." A Textbook and Treatise on Malocclusion, giving Technique of Treatment and Appliances. With illustrations. By EDWARD CANNING, D.D.S., Professor of

Orthodontia in the Colorado College of Dental Surgery.

"Stomatologie du Médecin Praticien." Avec 169 figures dans le texte et 4 planches hors texte. By Dr. PIERRE RÉAL, Dentiste des Hôpitaux de Paris. Masson et Cie., Éditeurs, Libraires de l'Académie de Médecine, 120 Boulevard Saint-Germain, Paris, VI. 1919. Prix 7 fr.

"Dental Surgery and Pathology." By J. F. COLYER, F.R.C.S., L.D.S., Dental Surgeon to Charing Cross Hospital and the Royal Dental Hospital; Examiner in Dental Surgery Royal College of Surgeons of England. Fourth Edition. With Illustrations. Longmans, Green & Co., 39 Paternoster Row, London, E. C. 4; Fourth ave. and 30th st., New York; Bombay, Calcutta, and Madras. 1919. Price \$12.00.

REVIEW OF CURRENT DENTAL LITERATURE

[*The Nineteenth Century and After*, January 1919, pp. 159 to 166.]

Dentistry and the Nation. BY GEOFFREY A. PHILLIPS.

It is rare to find, outside the narrow range of professional, technical, or scientific journals, an article of sufficient soundness and importance to deserve dental attention. Although Phillips is an Englishman, writing of English conditions, the needs and tendencies upon which he dwells are worldwide. Furthermore, to evaluate sympathetically his proposals, one must think not so much in terms of the dentist as in terms of the citizen having at heart state and national health.

The main facts of the first part of this paper show that owing to failure to seek it in the early stages of disease, proper treatment takes up an unduly large amount of time and becomes very expensive, and because too few are competent to give it, adequate attention is possible only to few. Phillips finds two requirements are necessary to bring dentistry to all the people—(1) a great further appreciation and desire for conservative

dentistry (the preservation and maintenance of the teeth in a sound state), and (2) an adequate supply of competent operators. It follows that there must be two grades of practitioners, both trained in conservative work and both under state control, to safeguard the public. For the first of these to come into being in sufficient numbers the essential is a suitable course of training, much more economical in money, time, and effort than is needed for the present diploma (in England). For the other, the course of studies must be re-designed to make dentistry a more scientific profession. If the first be secured, unqualified practice can be restricted. Mechanical dentistry (including prosthetic and operative procedures) will be less and less required, and the objectionable part of the surgical work gradually reduced. If, without impairing efficiency, time can be so saved that, for the one, the course will be reduced to two years, and for the other, two years can be freed for further studies on the scientific side, but little difficulty will remain. It is Phillips' contention that the pupillage in dental mechanics presents opportunity for

this economy. His purpose is to show the small relative value of this training in the public interest, the objections to it from the professional point of view, and *its diminishing need in the future*. If it be deleted from the course altogether, the student is spared the only part of his training that is rather that of a technical industry than of a profession. The public does not require that he shall be trained or examined in this work; his career will be assured without it, and *owing to his efforts the need for such work will decline rapidly*. Apart from these considerations, the training in dental mechanics, itself of doubtful suitability for inclusion in any university course, leaves the graduate but an indifferent mechanic, and it fails to equip him for giving to mechanics he may employ such instruction as they require of him in the higher science of prosthesis and what may be termed the mechanics of dentistry. The deletion of this subject as it is means, then, the loss merely of such general manipulative skill as mechanical training might have created—an uncertain, varying quantity, of debatable value, for which compensation can easily be arranged in remodeling, as is desirable, the essential parts of the course.

The other requirement—increased appreciation of conservative dentistry—is a matter of educating the public. Prophylactic dental treatment must be, like education itself, compulsory, so that no child or other person may fail to reach a normal standard in oral health.

[*Weekly Bulletin of the Department of Health*, City of New York, March 29, 1919.]

Work of the Department of Health's Dental Clinics for School Children.

The Bureau of Child Hygiene has maintained for the last six years special dental clinics for school children. During 1918 the dental staff comprised 1 supervising dentist, 9 operating dentists, 8 nurses, and 3 dental hygienists. Lately, because of war economy, the 3 hygienists were dropped, but it is hoped, owing to the results accomplished by them, that an increased number of similarly skilled instructors will soon be provided to continue the work. The plan has been to select children from the age of school entrance up to about ten to twelve years. Besides the school children, the clinics do work for others who

have applied for employment certificates, but who, because of the condition of the mouth, cannot pass the required physical examination. Necessary dental work in the mouths of children thought to be predisposed to tuberculosis is a most important factor in the program of these clinics.

The work done in the clinics consists of filling, extraction, and operative treatment, together with lectures, demonstrations, and instruction. Some attempt at prophylactic work has been made by the dental hygienists. The basic idea back of the dental work has been to carry home to the child the knowledge of what a clean, healthy mouth is, and the aid it is toward a healthy body. Warning against charlatans is given. Re-examination, six months to one year after completion of the work, is required. Over 80 per cent. of these children on re-examination need very little new attention. It was thought advisable to adopt for the children what is known as the rotary or circular movement of the brush in cleaning the teeth.

The principals and teachers in the schools say they have noticed the effect upon the children of this dental care, especially in what may be termed the improved tone of the pupil's personal hygiene. The department is in constant receipt of requests to extend its work in directions and to an extent far beyond the reach of the appropriation available.

[*International Journal of Orthodontia and Oral Surgery*, St. Louis, July 1919.]

A Preliminary Study of the Effect of "Rickets" on the Jaws. BY HUGH K. HATFIELD.

In current dental literature and in orthodontic text-books one finds the following conception of the disease: Rhachitis, characterized by a faulty development of bone, is a very important etiologic factor and deforming agent in malocclusions. Eruption of deciduous teeth is delayed, and these in turn are lost early, with resulting malocclusion in the permanent dentition. There is faulty development of the alveolar process and of the bones of the mandible and maxilla. The marginal ridge of the alveolar process is thickened and rounded. The maxillary incisors are usually small, soft, and friable; the permanent teeth exhibit enamel dystrophies. The upper jaw is narrowed or V-

shaped in form; the palate high-vaulted, the teeth crowded, the mandible shortened or trapezoid in form; maxillary alveolar processes have a tendency to turn out; mandibular, to turn in. Of these signs the narrow or V-shaped maxillary arch with high-vaulted palate seems to take first place as a characteristic deformity of rhachitis.

In order that no doubt might exist in Hatfield's mind as to the presence of these malformations, he examined a group of rhachitic cases (15 cases of rickets out of 150 children in the Massachusetts Hospital School for Crippled Children), and made models of the jaws of every child in the group. In the light that rickets is essentially an epiphyseal disturbance of the bone, and also that in the mandible there are no epiphyses, and the growth of this bone is not of an epiphyseal character, it would seem unlikely that any specific deformity would characterize the mandible in rickets. A softening of the bones is characteristic of this disease. The form which the bone takes on as a result of rickets is not typical of the disease, but rather it expresses the mechanical forces acting upon it. The mandible is a plastic structure in health, and under the stress of mastication preserves its form; hence in the softening of the bone and with uniform muscular weakness, no change in the bone necessarily occurs. In assuming that the pull of the masseter, for instance, deforms the bone in rickets, it is inferred that it is the rigidity that resists the pull in health, which is contrary to the physiologic nature of bone. If the bone were to be deformed as the result of the softening which is characteristic of rickets, then the current conception of the normal morphogenesis of bone is at fault. Hatfield believes that the morphogeny of bone expresses an equilibrium determined by function, that it is molded by physical forces to which it is subjected and the muscles acting upon it, and that to change the form of bone there must be applied either artificial force or stimulus directly or indirectly through *changed* muscular action. There is no evidence at present of any changed muscular action during mastication in a rhachitic child during the acute stages when the bones may be softened.

Consonant with this are the findings of Hatfield. A careful study of each of the 15 cases seems to show nothing in the nature

of jaw formation which might be called characteristic of the disease, and instead of the narrow or V-shaped and high-vaulted palate, the arch forms seemed well within the limits of normal variation.

[*Bulletin et Mémoires de la Société Médicale des Hôpitaux de Paris*, April 4, 1919.]

Syphilis as a Factor in Buccal Leukoplakia. BY G. RAILLIET.

The present work is based in part upon serological tests and in part upon the serial examination of verified syphilitics. Of 27 patients to whom was applied the Bordet-Wassermann test, 14 were negative, 5 partially positive, and 8 positive. The examination of 111 verified syphilitics revealed with certainty a percentage of those affected with leukoplakia constantly increasing with the length of the disease—*e.g.*, at the end of the second year after contraction of syphilis, 70 per cent. revealed leukoplakia. A second table proves that the intensity of the leukoplakia augments with the increasing duration of the syphilitic infection.

In addition to the above, Railliet reviews the occurrence of leukoplakia in affections which frequently exhibit a syphilitic etiology. Patients suffering with chronic rheumatism (particularly in its vertebral, and above all in its lumbar or sacro-iliac localizations), arthritis sicca, vague and recurrent arthralgias, sciatica, vague pains of the legs—such patients manifest a high frequency of concomitant leukoplakia.

Leukoplakia is very frequent in rhachitic subjects. Dental erosions (hypoplasias or dystrophies of the enamel) accompany about 50 per cent. of cases of leukoplakia.

The converse is also true. There is constant absence of leukoplakia in patients suffering from conditions rarely associated etiologically with syphilis, *e.g.*, the tachycardia of war.

Railliet draws the following conclusions:

(1) In verified syphilitics the frequency and intensity of leukoplakia clearly augments with the lengthening of the duration of theluetie infection.

(2) In cases other than verified syphilis, leukoplakia is common in a number of affections in which syphilis appears to be a predominant etiologic factor.

(3) In the absence of every antecedent or

symptom of acquired syphilis, leukoplakia is still frequently observed in absence of the adequacy of causes (even tobacco) often invoked to explain its presence. In such cases there are found many times the stigmata of congenital dystrophy which suggest a reference to congenital syphilis. The frequency of negative Wassermann's in cases of leukoplakia cannot weaken the foregoing conclusions, for this fact is common in latent acquired syphilis as well as in the congenital form.

Without pretence of exactness, Railliet believes, basing his opinion upon the examination of syphilitics affected with leukoplakia, that less than 15 per cent. of cases of leukoplakia are not traceable to syphilis. (Cf. Brocq, DENTAL COSMOS, September 1919.)

[*Chicago Medical Recorder*, April 1919.]

Streptococcus Oral Sepsis. BY N. B. POTTER, S. BRADBURY, AND A. McNEILL.

This article is of special interest because it gives more data upon the application of the complement fixation test to determine the culpability of oral lesions as infectious foci. These same authors have worked some time in this field (see DENTAL COSMOS, May 1918, p. 450). Also compare Cotton (DENTAL COSMOS, May 1919, p. 423).

The technique used was that of the classical Wassermann test, except that an antigen prepared from several strains of streptococci was used. These were obtained from clinical cases showing widely varying conditions of streptococcic infection.

Twenty-one cases were followed up carefully for two years or longer, and have very largely recovered or very decidedly improved, due, the authors believe, to the elimination of a definite focus of chronic infection, usually in the teeth or tonsils. Details of eight cases are given for purposes of illustration.

They conclude that even with an imperfect antigen, the results of a complement fixation test for streptococci in oral sepsis complicating or causing many forms of chronic invalidism, support in general the clinical evidence of the importance of this organism, and emphasize the desirability of further attempts along this line to assist diagnosis.

A second part of this report deals with a routine examination of the blood in twenty-four cases of pronounced oral sepsis. The

only suggestive feature was a high normal lymphocyte percentage, which, however, is certainly no more striking than in any collection of patients who consult the physician for some minor ailment.

[*New Jersey Dental Journal*, April 1919.]

Complement Fixation Tests as Applied to Dental Practice. BY ANGELO ZABRISKIE.

Case B, male, age thirty-eight, in poor health for four years. Several attacks of boils on back of neck. Slight glycosuria. Teeth suspected. Roentgenographic examination of dental region negative. Complement fixation test was positive to the colon bacillus, but negative in regard to streptococic infection. This further confirmed the innocuousness of the teeth. Further study revealed complete gastro-enteroptosis, "floating kidney," and "stone in the bladder." The condition of the patient was so serious that, in default of the cumulative evidence of the roentgen ray and the complement fixation test, extraction of the teeth would have been justified on general principles.

Case C, female, age about twenty-eight, had been ill six or seven years. Teeth had been suspected from the first. Hysteria, neuritis, and neuralgia. No relief followed appendectomy or extraction of impacted mandibular third molars. Wassermann + + + +: complement fixation tests for gonococcus, + + + +; for streptococcus, + + + +; for staphylococcus and catarrhalis, each + +. On the basis of the streptococcus + + + +, dental treatment seemed *inter alia* indicated. The treatment or extraction of the infected teeth would not alone have effected a cure, but the elimination of oral infection was certainly a logical part of the treatment.

Case D, male, age about thirty, severe heart affection. A positive complement fixation test for streptococci; negative for other organisms. Dental roentgenograms showed rarefied areas. A negative complement fixation was obtained within forty-eight hours after elimination of oral infectious focus. Was able to pass insurance examination, and accepted for aviation corps. Recurrence of former symptoms. There was found to be a return of streptococcus infection. Tonsils found diseased, and were removed. Patient fully recovered, and was accepted for flying.

Case E, male, age seventy-four; heart affec-

tion, gastro-intestinal disturbances, and senility. Positive complement fixation toward streptococci, other tests negative. Roentgenographs showed periapical infection. Removal of the focus was followed by a negative complement fixation test toward streptococci in twenty-four hours. The case was complicated by gastro-enteroptosis. After treatment for this condition, improvement was very marked.

[*Archives of Ophthalmology*, New Rochelle, N. Y., March 1919.]

Jaw-winking Phenomenon and Its Explanation. BY A. LUTZ.

By the term "jaw-winking phenomenon" Lutz refers to that striking and curious appearance of retraction of the upper eyelid during movements of the jaw, of the face, of the pharynx, and of the tongue. For previous notice of this condition, see DENTAL COSMOS, June 1919, p. 501 (Damel and Natale), wherein five cases are mentioned. This association of masticatory and ocular movement was first described by Marcus Gunn (1883); since then about 90 observations have appeared in the literature. A comparison of them gives the following conclusions:

(1) The jaw-winking phenomenon appears more frequently in the male than in the female; in the majority of cases the retraction occurs on the left side.

(2) The retraction takes place, as a rule, on one side only (in only 2 of the 90, bilateral).

(3) The majority of patients state that the jaw-winking phenomenon was already in evidence at the time of birth, and that it continued during their lifetime without any alteration.

(4) The jaw-winking phenomenon also sometimes appears in several members of the same family.

(5) The phenomenon can be best observed when the patient looks downward, and becomes invisible during elevation of sight.

(6) The retraction is in nearly all cases involuntary.

(7) The phenomenon appears very rarely alone without other complication. Generally the phenomenon is accompanied by involvement of some of the eye muscles, especially those of the lid. About 80 per cent. of the

cases show ptosis. In one case (Wecker) there also existed a certain rigidity of the jaw; in another case (Uthoff) a slight contraction of the facialis of the same side.

(8) The retraction of the eyelid is a pathological appearance; under normal conditions it cannot be observed in healthy people. Consequently it differs fundamentally from the concomitant winking contractions of the orbicularis oculi which follow so often a facialis paralysis.

(9) In the majority of cases, the jaw-winking phenomenon can be produced by lowering the jaw. It is never produced by closing the mouth. In about the same number of cases it is produced by moving the jaw downward and to its opposite side. In rare cases it is produced by lateral movements of the jaws. A number of cases prove that the jaw-winking phenomenon is not only produced by the innervation of the nuclei of the same side, but also by that of the contralateral side. Clinical observations show that the retraction of the eyelid is associated with innervation of the trigeminus, with that of the abducens, facialis, glosso-pharyngeus and vagus, and with that of the hypoglossus.

(10) All cases, congenital as well as the acquired, have a common feature, namely, that the abnormal movement of the lid occurs with the so-called principal movements of Munk (*e.g.* chewing, swallowing, laughing) which are already developed in the first days of the newly born infant, and whose centers must be sought for in the thalamus opticus.

(11) Operative treatment has resulted only in correcting the ptosis. The retraction of the eyelid remained unaltered or reappeared soon.

Lutz reviews the various explanations which have been suggested for this phenomenon, and offers for himself the following: The vehemence of the phenomenon, the fact that it could voluntarily be produced (in one case), and the fact that it can be suddenly acquired, induces Lutz to believe that the jaw-winking phenomenon in its congenital as well as in its acquired form is produced by alterations of the supranuclear connections of the bulbar nuclei traveling in the fasciculus longus posticus, and probably by a lesion of the inhibitive mechanism just before the dendrites of the damaged nuclear cells of

the nervus oculomotorius. The palsy of the other eye muscles, so often accompanying the jaw-winking phenomenon, is then caused by lesions of the nuclei themselves or of the last unilateral part of the afferent or efferent fibers.

A similar concomitant movement of the lower eyelid has been observed by Herbert Robson (*Lancet*, 1907).

[*Southern Medical Journal*, Birmingham, Ala., March 1919.]

Ocular Syndrome of Dental Origin. BY H. H. MARTIN.

The patient, a man of forty-nine years, complained of imperfect vision and a floating opacity in the right eye (the left eye remained throughout entirely unaffected). No visible lesion was found in any part of the uveal tract; pupil reactions normal; vision with correction (compound myopic astigmatism) was O.D. 20/50, O.S. 20/20. Fundus normal. Vitreous was in posterior two-thirds perfectly clear, but the anterior third was quite cloudy, showing numerous small granular and filamentous floating opacities. No

scotomata. Marked irregular concentric contraction for white. Tension normal. History, Wassermann, von Pirquet, and urinalysis, negative.

The only focus of infection demonstrable was at the apex of a right maxillary incisor. This tooth was extracted. Improvement was immediate. In about six weeks vision was 20/20, the field was normal, with one single floating opacity visible with a plus 10 lens.

About two and a half months later the patient returned with precisely the same clinical picture in the same eye. Marked tenderness over site of former dental lesion with two minute fistulous openings through roof of mouth just distal to the former site of the right maxillary incisor. The dental lesion was exposed and thoroughly curetted; a small alveolar sequestrum was removed. Patient discharged with complete relief two months after the relapse.

The unusual features of this case were the contraction of the visual field, the sharp limitation of exudates to the anterior two-thirds of the vitreous, and the startling promptness with which all symptoms began clearing upon removal of the dental lesion.

PERISCOPE

Personal Experience with Lane's Plate in Fractures.—Among 1560 fractures of the long bones observed during a three-year period, there were 172 open operations, 41 for compound fractures, and 129 for reduction of simple fracture and delayed or non-union, or vicious union. Lane plates were applied in twenty-eight instances. Primary healing of the operative wound was obtained in every case except two compound fractures with severe displacement. Excellent final results were obtained, however, in spite of this risk. In four cases sinuses developed after some weeks. On removal of the plates, the sinuses closed, except in one instance in which a low-grade osteomyelitis was caused by the plate. The plates and screws in this instance had been handled by the operator. The pa-

tients were all urged to have the plates removed after firm union had taken place, and this was done in four instances. No abnormal bony reaction or tissue reaction had been found. In one case a plate was placed on the femur eighteen months after the fracture, and the result was excellent. Probably removal of considerable bone and apposition of healthy non-sclerotic fragments explained this success. The cases of sinus all occurred in the radius and ulna, or tibia and fibula; there was no trouble in any of the femur cases. It seems, then, that Lane plates offer a satisfactory means of fixation in selected cases. They are more efficient than other agents in highly comminuted fractures, when other fixation materials may increase the trauma.—PAUL P. SWEET, *Journ. A. M. A.*

The Record of Vaccination.—In the municipal hospital of Philadelphia, during thirty-four years, in which time over 9000 cases of smallpox have been treated, no physician, nurse, or attendant who has been successfully vaccinated or revaccinated prior to going on duty has contracted the disease. On the other hand, in the fever hospitals of London, according to Ernest Hart, in 1893, of 2484 persons employed, 130 became infected and two died; seventy-three had scarlet fever, and twenty-three contracted diphtheria. The deaths from smallpox in England are thirteen per million for medical men (who are well vaccinated) as against seventy-three per million of the general population; whereas fifty-nine medical men per million die of scarlet fever as against sixteen per million of the general population.—WELCH and SCHAMBERG, *Journ. A. M. A.*

Radiography and Orthodontia.—My experience in radiography, coupled with my work in orthodontia, causes me to believe we should be more and more insistent on complete radiographic examinations of all patients under orthodontic treatment. The congenitally missing teeth, anomalous dentition, precocious or retarded as the case may be, the serious impactions of teeth—these and other conditions multiply the difficulties of our work, and nothing so assists in clearing up the whole matter from the diagnostic standpoint as the careful use of radiography. To ignore it is to invite needless troubles, subjecting our patients to useless delays, and in the end resulting in much personal humiliation to the operator. Why shall we, therefore, not make a hard-and-fast rule that under no circumstances will we proceed with orthodontic treatment until the radiographic examination is made?—B. FRANK GRAY, *Internat. Journ. of Orthodontia*.

Setting of Small Inlay Bridges.—Owing to the slight movement of the teeth carrying the inlays of small bridges, one of the inlays will very often move. To overcome this, the two methods I have found most successful are as follows: (1) Where there is heavy pressure one inlay is anchored deeply; at the other end of the bridge a flange is carried into the inlay, the inlay having been prepared to receive it. This free end is not cemented, allows for any slight movement of the teeth, and receives its due amount of pressure. (2) Where the inlay bridge may carry a central or lateral, and having pressure from within outward, one inlay is set with cement, the other inlay is roughened slightly, and set with a small layer of white base-

plate gutta-percha. This small layer of base-plate gutta-percha acts as a cushion to overcome the movement of the teeth, and takes up any sudden pressure.—BASIL JONES, *Commonwealth Dental Review*.

Method of Making an M. O. D. Inlay.—Take a modeling compound impression in a copper band, pack this with copper amalgam, then swage a matrix of pure gold, which can be tried in the cavity to verify its fit, and burnish over all margins. Then lay the matrix aside and make a wax model in the mouth, carving the occlusion, contact points, and sulci. This model is then transferred to the swaged matrix, and if it does not easily go to place it is slightly scraped until it will; it is then sealed to the matrix with a warm spatula; at the gingival margins, and all overlapping margins where an inlay is liable to pull away in the casting, carve out of the wax a groove next to the matrix, leaving the matrix free at these points, so when the inlay is cast it can be transferred to the cavity in the tooth, and the matrix again burnished to the cavity margins. When satisfied with the margins, pack the grooves with mat gold, and flow them full of solder.—G. P. ROBERTSON, *Texas Dental Journal*.

Method of Firm Attachment of Vulcanite to Aluminum Dentures.—An aluminum plate with teeth attached by vulcanite forms a very light denture, comfortable to wear, and of little bulk. It is well known, however, that after being for some time in use the vulcanite is liable to separate from the aluminum, as the result of some chemical or electro-chemical action. A method of obviating a breakdown from this particular cause would probably lead many practitioners who have abandoned the combination to try it afresh. When the case is ready for rubber packing, the cleaned aluminum surface is coated with a thin solution of rubber in chloroform, and over this, when dry, is carefully packed a layer of weighted rubber, and the further filling of the mold space is completed with ordinary rubber. Those who have tried this method claim that the attachment between vulcanite and aluminum remains sound, and a stable union between the two is secured. A similar use of weighted rubber—of the metallic filling kind—was some years ago found very serviceable with the other metals in attaching teeth by vulcanite to "wire bar" lower cases; the resulting union was so very close and intimate that hardly anything short of filing or chiseling would effect their separation.—*Dental Record*, per *Dental Register*.

Dental Broach Swallowed.—A woman, age fifty, was sent to us for the localization of a foreign body in the throat. During a dental manipulation the surgeon allowed a broach, a root drill for right-angle attachment, to slip from his fingers, and the patient swallowed it. The instrument was 3.5 cm. long, and was shaped like an ordinary hypodermic syringe needle. A skiagraphic examination showed it to be present in the pharynx well below the entrance of the larynx. Dr. H. Seaward Marsh cocaineized the throat and pharynx, and with a laryngoscopic mirror could see a portion of the broach. The large end was in the recessus piriformis, and the upper, sharp end had perforated the pharyngeal wall to a depth of 0.5 cm. The instrument was then grasped with long laryngeal forceps, and by depressing the instrument, the upper, sharp end was disengaged and the foreign body removed. The patient made an uninterrupted recovery.—J. G. and W. A. EDWARDS, *Med. Journ. of Australia*, per *British Dental Journal*.

Relation of Teeth to the Ridge in a Lower Denture.—By setting the lower teeth directly over the lower ridge, and as close to the ridge as esthetics will permit, the stability of the lower denture is greatly increased. Taken bucco- or labio-lingually, the center of any given lower tooth should be directly above the middle line of the lower ridge. When the lower teeth are placed in this manner the tongue is allowed ample room, and the buccal and labial muscles are prevented from exerting a dislodging pressure on them in either speech or mastication. The objection may be raised here that upper teeth will be set an unnecessary distance outside of the ridge, due to the fact that the lower ridge is usually considerably larger than the upper. This is so, but the area of the upper affords greater possibilities for retention, and the upper denture rests on an immovable supporting member which more than offsets any increased leverage caused by setting the upper teeth outside of the ridge when this is necessary.—RUSSELL W. TENCH, *Dental Digest*.

The Face-bow.—What is a face-bow for? Not for taking the bite. It is a register for recording the distance from every point in the alveolar process to the centers of rotation or centers of the condyle; so that when our casts are mounted on the frame by means of the caliper, the plane of the cast will sustain the same relationship to the rotation centers of the articulator that the natural

planes do to the center of the condyle. What is this for? Why is it necessary that they should occupy the same relationship? Because we set the teeth on the lower, and they are subject to the lateral swing. We must have them the same distance forward from the swing that they will occupy when placed in the mouth, otherwise the paths we create in the occlusion of the teeth will not point in the right direction when placed in the mouth, and we will have cusp interference. By having the paths the right distance forward, and setting our teeth on the base-plate they will need little modification when introduced into the mouth.—J. H. PROTHERO, *Dominion Dental Journal*.

Strength of Epinephrin for Local Anesthesia.—(1) What strength of epinephrin (adrenalin) should be used in injecting tonsils for local anesthesia? *Ans.* From 10 to 15 drops of the 1 : 1000 solution of epinephrin per ounce of anesthetic solution is the strength usually employed. (2) What are the dangers of strong solutions of epinephrin, aside from the secondary hemorrhage? *Ans.* The chief danger of strong solutions lies in the possibility of injecting it inadvertently into a vein, in which case 1 cc. of a 1 : 1000 solution might produce most alarming and even fatal results from overwhelming effect on the circulation. In subcutaneous infiltration there is the additional danger of necrosis from excessive vaso-constriction, but this probably does not apply to as vascular a tissue as that of and around the tonsil. (3) Would 1 dram of 1 : 1000 solution of epinephrin to the ounce of 1 : 500 cocaine, and using 2 drams in each tonsil, be dangerous? *Ans.* The addition of 1 dram of a 1 : 1000 solution of epinephrin to the ounce of 1 : 500 cocaine would probably not be very dangerous, but the concentration is greater than that usually employed, and when the solution is used as freely as 2 drams per tonsil it might not be entirely devoid of danger.—*Journ. A. M. A.*, per *Dental Register*.

Technique of Wiring Corresponding Teeth of Superior and Inferior Maxillæ in Fracture of Inferior Maxilla.—The mouth is cleansed by irrigating with a weak hydrogen dioxid solution followed by sterile water. Clots of food may be loosened with a wooden applicator mounted with cotton. If the patient is excitable, anesthesia (nitrous oxid and oxygen or ether) is required. The fracture is then reduced, and any loose tooth in the line of fracture removed. When the

occlusion is correct, the teeth to be wired are selected, and the jaws separated again.

Six-centimeter lengths of copper wire, No. 26 or smaller, are cut, and the teeth of the superior maxilla prepared first. The upper first molar is taken, for example. The cheek is gently retracted with the finger or Parker retractor, and the wire slipped through the approximal interdental space. Each end is grasped with a clamp and the protruding ends twisted, the first twist fixing the wire around the body of the tooth, and again until six twists are made. If the two ends are grasped in one clamp and twisted, the tension from torsion snaps the wire before it clinches the tooth. The wire must be proximal to the shoulder of the tooth, and take the shape of the circumference. The remaining selected teeth are prepared in the same manner.

Once the wires are in place, the inferior jaw is forced into position of correct occlusion, the wires of the corresponding teeth are twisted or hooked together, the superfluous portions cut off, and the rough ends turned against the teeth and guarded with dental wax or rubber. If the wires are properly applied, no adjustment from day to day is necessary.

The wires may be removed at from the fourteenth to the twenty-first day; the longer period is advisable unless their earlier removal is deemed judicious.—E. BUTLER, *Amer. Journ. of Surgery*.

Position of the Contact Point.—The position of the contact point is equally as important as its form. It will not do to build up a convexity at any part of an approximal surface, and because it necessarily comes first in touch with the approximating tooth conclude that we have made a satisfactory contact point. The position of the contact point depends to a very great extent upon the form of the tooth—the form of each surface, its height of contour, the mesial and distal marginal ridges, and the position of the tooth in the arch. To know where to place a contact point demands an intimate knowledge of tooth form. The best way to obtain that knowledge is by a careful study of Black's "Dental Anatomy"—the most important work in dental literature—in conjunction with the study of extracted teeth, prepared skulls, and finally the teeth of each patient.

In the best form of denture, composed of bell-crowned teeth, the contact points will be found to be in a line with the cutting edges of the incisors and canines, and slightly to the lingual of the buccal cusps of the bicuspids and molars. However, in thick-necked

teeth, and those of a more rounded contour, the contacts may be placed slightly more to the lingual. In some dentures, where the second and third molars are small and more rounded than usual, the contacts may be located midway bucco-lingually.

In the best formed arches the contact points are near the occlusal surfaces, and only so far away from them as will result from the normal sloping of the marginal ridges. If the contact points be placed too close to the occlusal surface, there will be a decrease in the amount of food that sweeps through the embrasures, and a consequent lessening of the scouring or polishing of the exposed approximal enamel, with the result that caries will have a greater opportunity to attack those surfaces. If the contact be made too far toward the gingival, as will be the case if the marginal ridge is not reproduced, the tendency will be for food to wedge the teeth apart, allowing it to impact upon the septal gingiva, something which must *never* be permitted. The septal gingiva fills the septal space in the form of an arch, with its convexity toward the occlusal, and the contact point should be placed where it will be just over the crest of the arch of the septal gingiva.—H. E. FRIESELL, *Journ. N. D. A.*

Technique of Administration of Nitrous Oxid and Oxygen to Children.—Dentists often are called upon by surgeons for aid in minor surgery cases, such as adenectomy and circumcision. For children either of these operations are more serious than extraction cases, and may, through nervous reflexes, cause the development of respiratory troubles, and the younger the child the more likely are these symptoms to be seen. Deep surgical anesthesia must be maintained without interruption.

Children less than five years of age generally are not regarded as proper subjects for this anesthetic. Children from five to fourteen years seem to present a different problem at all stages between these years. The very young are difficult to control before anesthesia, and those about twelve to fourteen very difficult after anesthesia is partly induced.

The youngster oftentimes will not submit quietly and therefore must be attended to in a special manner. After all efforts to induce the child to submit quietly have failed, the nitrous oxid and oxygen is allowed to commence flowing into the machine. The air valve on inhaler in this case is not opened. The oxygen is admitted in bountiful proportions from the beginning, and then the in-

haler is placed over nose and mouth at once, and no matter whether the child inhales through the nose or mouth or cries out, the gas is admitted to the lungs. Anesthesia develops quickly, and then the patient is placed in a correct anesthetic position, and if the oxygen supply is noticeably too great, it is gradually reduced.

If the child voluntarily submits, then the technique is practically the same as for the adult. Young children, however, as a rule, breathe more freely through the mouth after it is open, therefore it is advisable to place the inhaler over the mouth until anesthesia is induced, at which time it may be

placed over the nose. It is well also to admit oxygen to the mixture plentifully and early, because often asphyxia develops so quickly and suddenly that symptoms are seen even before anesthesia, and are attended by violent muscular contractions of a general character. Discernment is necessary at this stage, for the reason that inexperience may misinterpret these muscular movements as voluntary; it would be a serious mistake to continue without oxygen.

A liberal supply of oxygen prolongs the induction period, and prevents the development of the foregoing symptoms.—J. P. HENAHAN, *Dental Register*.

OBITUARY

Dr. Chas. King Van Vleck.

[SEE FRONTISPIECE.]

DIED, at his home in Hudson, N. Y., July 14, 1919, from intestinal poisoning, CHAS. KING VAN VLECK, D.D.S.

Dr. Van Vleck was born in Hudson, N. Y., January 16, 1854, the son of Dr. Wm. B. and Anna (King) Van Vleck, Dr. Van Vleck's father being a dentist and practicing his profession for a number of years with his brother, Dr. Henry H. Van Vleck, in Hudson.

Dr. Chas. Van Vleck received his early education in the Hudson public schools and Hudson Academy. He early became interested in dentistry and began the study of his future profession under his father. In 1875 he entered the New York Dental College, where he pursued the course in dentistry for one year, the next year entering the Pennsylvania College of Dental Surgery, from which institution he was graduated in 1878 with the D.D.S. degree. Immediately after graduation he established himself in practice with his father in Hudson, N. Y., where he continued to practice his profession until a few days before his death.

Dr. Van Vleck belonged to the so-called "old school" of dentists, and was well and favorably known throughout the State of New York as well as in the profession at large. He was always a close student of the evolu-

tion of his profession and permitted no improvement or progressive step to pass untried, his endeavor being to keep himself fully abreast with the progress of dentistry, and in this endeavor he notably succeeded, being one of the foremost leaders in operative dentistry.

Dr. Van Vleck's genial personality attracted to him many close friends in the dental profession, and he never lost an opportunity to foregather with the members of the various dental societies with which he was connected. He was also a true citizen in every sense of the word, ever having at heart the best interests of the community in which he lived, having served in various public offices in Hudson. He was for many years on the board of education and the board of health of Hudson. He was a member of the Third District Dental Society of New York, the Odontological Society of New York, the Dental Society of the State of New York, the National Dental Association, and the Delta Sigma Delta Fraternity. He was also a member of the Hudson Lodge of Elks, in which organization he had held many prominent offices.

Dr. Van Vleck was married in 1885 to Miss Julia A. Gray of Hudson, N. Y., who, with one daughter, his mother, and one brother, survives him.

Dr. Van Vleck's remains were interred in the Hudson Cemetery on July 17, 1919.

Dr. Max Neal.

DIED, at St. Nazaire, France, March 16, 1919, of bronchial pneumonia, MAX NEAL, D.D.S.

Dr. Neal was born in Hamilton, Pa., in 1884, the son of Chas. S. and Margaret

the Dental Reserve corps of the army, and as captain served for eighteen months with the University of Pittsburgh base hospital unit No. 27 at Angers, France, and died while in the service of the Government.

Dr. Neal was a member of the Odontological Society of Western Pennsylvania, the Penn-



DR. MAX NEAL.

(Mitchell) Neal. He obtained his early education in the schools of Hamilton and later at the Indiana normal school. In 1906 he entered the dental department of the University of Pittsburgh, graduating with the D.D.S. degree in 1909. Immediately after his graduation he began the practice of his profession in Pittsburgh, and at the same time was associated with his alma mater in the capacity of demonstrator in clinical dentistry.

At the outbreak of the war he enlisted in

sylvania State Dental Society, the National Dental Association, the American Institute of Dental Teachers, and the Psi Omega Fraternity.

He was married in June 1911 to Miss Kathleen Wood of Pittsburgh, and is survived by his widow, father, mother, four sisters, and two brothers.

His remains were interred with full military honors in the American cemetery at St. Nazaire, France, March 17, 1919.

DENTAL LEGISLATION

AND

LEGAL DECISIONS.

SPECIAL NOTICE.

Legal Opinion on Section of Illinois Dental Law Relating to Registration of Licenses.

TO THE EDITOR OF THE DENTAL COSMOS:

Dear Sir,—The last General Assembly of the State of Illinois repealed the section of the dental law requiring the biennial renewal of dental licenses and also providing a way to restore licenses which had been canceled for failure to pay the renewal fee within the time required by law.

I am inclosing herewith a copy of the opinion of the Attorney-general of Illinois as to the effect of this repeal. You will observe that all persons who hold dental licenses and who were not in good standing July 1, 1919, are without authority of law to practice

dentistry in Illinois. Inasmuch as the section which provided the manner in which licenses might be restored was repealed, there is now no way to be restored as a licensed dentist except by filing formal application and passing an examination.

The Department most respectfully requests that you publish the inclosed opinion of the Attorney-general in your next issue, with such additional information as you may desire.

Yours respectfully,

F. C. DODDS,

SPRINGFIELD, ILL. *Sup't of Registration.*

OPINION.

LAW DEPARTMENT, SPRINGFIELD,
July 24, 1919.

DENTISTS.

MR. FRANCIS W. RICHARDSON, *Director*,
Dep't Registration and Education,
Springfield, Ill.

Dear Sir,—I have your letter of July 8th, in which you call my attention to the repeal of section 14 of "An Act to Regulate the Practice of Dental Surgery and Dentistry in the State of Illinois, and to repeal certain Acts therein named," by the provisions of House Bill No. 541, which was passed by the 51st General Assembly and which became a law without the Governor's signature, and desire to know the status of the licensed dentists who on July 1, 1919, had not paid the biennial renewal fee

of \$1 which was due November 1, 1917, and whose licenses were canceled for failure to secure the renewal certificate within a period of six months after November 1, 1917, and who had not paid the restoration fee of \$20.

In reply I beg to state that it is my opinion that a licensed dentist who on July 1, 1919, had not paid the biennial renewal fee of \$1 which was due on November 1, 1917, and whose license had been canceled for failure to renew his certificate within six months after November 1, 1917, and who had not paid the restoration fee of \$20, is now without authority to practice dentistry.

Very truly yours,

EDWARD J. BRUNDAGE,
Attorney-general.

DENTAL COLLEGE COMMENCEMENTS

University of Southern California, College of Dentistry.

THE commencement exercises of the College of Dentistry of the University of Southern California were held at the First Methodist Church, Los Angeles, July 8, 1919.

The commencement address was delivered by Major Charles D. Lockwood, M.D., F.A.C.S.

The degree of Doctor of Dental Surgery was conferred by George Finley Bovard, A.M., D.D., LL.D., president of the university, upon the following graduates:

Frederick R. Allan	Utah	David E. Jacobs	New York
Henry F. Barnewolt, Jr.	California	Arthur D. Juenger	California
Ralph E. Barton	California	Timothy F. Kane	Colorado
Edna V. Bartzten	Montana	Kaname Kotera	Japan
Edward I. Berkowitz	California	Frederick L. Kreck	California
Adolph Boehm	Austria	Alexander Krikos	Washington
Odessa L. Brown	California	Harold A. LeSieur	California
William W. Brown	Utah	Milton F. Lorenz	Iowa
Herbert E. Capps	California	John E. Lucy	California
Fred B. Carlisle	California	Forrest McClara	California
George H. Chiles	Colorado	Albert R. Martin	California
William H. Craig	California	Fred. H. Medlin	Arizona
George E. Crandall	Kentucky	Jesse T. Meredith	California
Carl P. Dixon	California	Kenneth W. Merrill	Utah
John H. Dougherty	California	Lynn L. Morgan	Utah
Ralph G. Dunn	California	Ricardo deC. Neves	Portugal
Joseph F. Durand	California	John R. Newcomer	Arizona
Hugh D. Elliott	California	Alexander Olincy	California
Harold C. Ellsperman	Washington	Angel T. Pappas	California
John W. Faris	Iowa	William G. Parker	California
James B. Finley	California	Alvah G. Phelps	Montana
George W. Fleischman	New York	William B. Philp	California
Lloyd A. Frasher	California	Frank T. Reynolds	Utah
Earl R. Fried	Washington	Oliver A. Roden	California
Justin F. Gibson	California	Ralph M. Rogers	California
Edward A. Gilbert, Jr.	Nebraska	Elsie C. Schildwachter	California
Herschel S. Glick	Indiana	Richard H. Sellwood	Utah
Isaac E. Gold	Illinois	Maurice Smith	California
Blane J. Goodson	California	James W. Stanley	California
Earl E. Graham	California	Ralph B. Strong	California
Roy G. Gregory	California	Lloyd J. Taylor	California
John I. Hansen	Utah	P. Clarence Tennis	California
Donovan F. Harden	Missouri	Clarence E. Thompson	Iowa
Robert M. Harlan	Illinois	Ernest W. Thompson	California
William W. Harrison	California	Frederick E. Titensor	Utah
Charles B. Hawks	Massachusetts	Usakichi Tsukifuji	California
David F. Heron, Jr.	Arizona	Guy Van Buskirk	Louisiana
Floyde E. Hogeboom	California	Robert B. Vint	California
Francis M. Holland	California	Jack Werner	California
Daniel H. Horn	Ohio	Alfred L. Wilkes	California
Rufus L. Howard	New York	Frank R. Wilkinson	California

Philippine Dental College.

WE have received from Dr. C. Layoc, director of the College and president of the board of trustees, the following list of students who have received the degree of D.D.S. as the graduates for 1919:

Felix Angeles	San Fernando, Pampanga	Miguel Florendo	Vigan, Ilocos Sur
José Arce	Quiapo, Manila	Marcelo Gonzalez	Biñan, Laguna
Mariano Atienza	Taal, Batangas	Domingo de Guia	Candon, Ilocos Sur
Juan Bello	Zamboanga, Mindanao	Hermenegildo Lagman	Guagua, Pampanga
Irineo Carlos	Santa Cruz, Manila	Felipe Mijares	La Carlota, Occidental Negros
César Concepción	Malolos, Bulacán	Magín Riosa	Tabaco, Albay
Teodorico Cruz	Meycawayan, Bulacán	José V. Tolentino	Santa Cruz, Manila
Cayetana Eustaquio	Mariquina, Rizal	Gregorio de Vera	San Rafael, Bulacán

Loyola University, School of Dentistry.

At the annual commencement exercises of the School of Dentistry of Loyola University, 1919, held in New Orleans, Louisiana, the degree of Doctor of Dental Surgery was conferred on the following graduates:

C. Bayon	Louisiana	L. P. Laville	Louisiana
A. C. Broussard	Louisiana	W. A. McKenzie	Texas
R. J. Broussard	Louisiana	G. A. Penaherrera	Ecuador
W. L. Comeaux	Louisiana	C. L. Porterie	Louisiana
S. C. Fournet	Louisiana	G. O. Rosado	British Honduras
N. F. Gueno	Cuba	B. A. Schmidt	Texas
T. L. Hernandez	Cuba	H. L. Tilly	Louisiana
E. M. Laborde	Louisiana	W. S. Tucker	Louisiana

Meharry Dental College.

At the annual commencement exercises of Meharry Dental College, held in Nashville, Tenn., the degree of Doctor of Dental Surgery was conferred on the following graduates:

J. F. Abbott	Alabama	Chalmers Hairston	New Jersey
R. E. Ashe	Texas	I. L. Jones	Texas
J. T. Barnes, Jr.	Tennessee	J. J. Jones	Florida
J. W. Bland	North Carolina	Monroe Jordan	Tennessee
C. C. Brevard	South Carolina	A. E. King	North Carolina
J. F. Brooks	Texas	J. N. King	Alabama
Oreba T. Bryant	Oklahoma	B. L. Love	Texas
H. L. Burnett	North Carolina	C. C. Machen	Louisiana
O. A. Childress	Arkansas	W. W. Mason	Tennessee
Augustus C. Clark	Texas	J. C. Mayberry	Tennessee
E. J. Cling	South Carolina	Floyd Moreland	Illinois
O. C. Cooper	Tennessee	W. G. Newsom	Alabama
A. F. Cornwell	South Carolina	C. D. Nicholson	Texas
W. F. Dendy	South Carolina	P. M. Nixon	Tennessee
W. C. Easton	Louisiana	J. K. Perrin	South Carolina
E. L. Elliott	Alabama	Ocie Queen	Missouri
L. E. Eve	South Carolina	G. F. Snowball	Jamaica
Willa H. Faulkner	Tennessee	Buford Westbrook	West Virginia
R. A. Ferrand	Texas	S. K. White	Tennessee
G. W. Fields, Jr.	Illinois	I. S. Wilkinson	Louisiana
A. L. Fladger	South Carolina	J. K. Williams	North Carolina
Wm. T. Fuller	Jamaica	R. L. Williams	Texas
G. W. Glymph	South Carolina	U. W. Williams	Alabama

Kansas City Dental College.

At the annual commencement exercises of Kansas City Dental College, held in Kansas City, Mo., the degree of Doctor of Dental Surgery was conferred on the following graduates:

L. F. E. Anderson	William S. Diller	Wilbur E. Hoffman	Mortimore E. Reynolds
Max G. Armstrong	John L. Dunshee	Loran M. Huey	Fred A. Richmond
Hollis LeR. Barnes	Oltie B. Elliott	Francis W. Hurley	Mills C. Rickard
Virtus L. Bauersfeld	George K. Eyler	Harley F. Jacobs	Chester W. Rogers
Glen F. Benson	Otis S. Field	William C. Jessen	William M. Rollings
Marcus E. Bibler	Harry W. Fitzgerald	Emil G. Johnson	Frank A. Ryan
Thomas J. Boone	Felix D. Fortin	Joe McG. Johnson	Norman A. Seism
Clarence C. Brown	James Freer	Harry E. Jacques	Robert R. Seeds
Paul J. Brown	Russell E. Freidinger	John W. Kutrow	George M. Shields
Harold E. Brookover	Adolph H. Friedman	Wayne C. Light	Laurance W. Simmons
Carl C. Carter	Lester C. Gartin	Harold J. Lind	Vernon E. Simpson
Arthur J. Casford	William Guilfoil	Roy W. McLeland	John C. Stahn
John G. Christy	Arthur E. Glass	John A. Michael	Samuel B. Stewart
Lloyd E. Church	Ray L. Goodhuo	William H. Moore, Jr.	James C. Stobaugh
Uel W. Cobb	Lester N. Glaze	Emmet W. Mulkey	Charles R. Strode
Kenneth L. Cochrell	Virgil G. Griener	Elmer K. Musick	Edward C. Swigart
George McD. Coffey	Jesse R. Harper	Emmett LeR. Neil	Lionel V. Swift
Edson A. Condit	Charlie H. Hatten	William F. Newton	Leslie Timken
Guy L. Cowan	Russell L. Henderson	Jerold E. O'Connor	Alonzo B. Turk
Arthur O. Crowder	Leo B. Herrman	Robert S. Quinn	George E. Weight
Clell I. Cunningham	George H. Hoerman	Owen H. Randall	Charles R. Williams
Harold F. Dawson	Dick C. Hill	Judson B. Ratliff	George P. Williams
Ethan C. Deffenbaugh			

University of Buffalo, Dental Department.

At the annual commencement exercises of the Dental Department of the University of Buffalo, 1919, held in Buffalo, N. Y., the degree of Doctor of Dental Surgery was conferred on the following graduates:

William H. Abrams	Richard A. Dunning	Howard B. Kolpien	David J. Roach
Sherman S. Alvord	Clive O. Dusenbery	Louis H. Kominz	Allison S. Roberts
Michael W. Battle	Thomas E. Dwyer	Leon A. Konwinski	John F. Rowland
Robert J. Bennett	Stanislaus J. Dzimiran	Kenneth N. Lamberson	Clarence J. Savage
Ira J. Berlove	Emma E. Fisher	Thomas F. Landers	Worthington G. Schenk
Abraham L. Bernstein	William P. Foley	Stewart P. Landon	E. G. Schweinberger
Tracy M. Bissell	Leland F. Foote	Harley W. Lawrence	Edward A. Scully
Joel Bleich	Charles G. Fuller	Morris J. Levin	Samuel I. Sheris
James J. Brickwedde	Leon J. Gauchat	Sherwood S. Littlefield	Elmer L. Sleeper
Raymond C. Brown	Harold E. Gleason	John B. McDonald	John W. Smithwaite
Henry J. Burke	Michel M. Hali	Walter A. McGrath	William T. Sullivan
Alfred LeR. Catell	George W. Haye	Ernest R. McMichael	Raymond H. Swin
Leonard M. Claflin	George W. Hedden	Ralph D. Maguire	Merton E. Tillou
Ralph F. Clark	Alvin M. Hewitt	Fred A. Mangelsdorf	John B. Toomey
Herbert F. Coates	Ernest J. Hill	S. E. Mazurowski	LaMoyné J. Tatu
Mortimer Cohen	Roswell C. Hitzel	Louis H. Meisburger	Eugene A. Turgeon
Howard L. Coons	Rose A. Holsman	Charles W. Mesick	Herbert L. Ungerer
Francis P. Cronin	Stacy R. Hunt	Arthur L. Moore	Welles W. Ward
James A. Cunningham	William B. Jackman	Albert L. Morris	Charles K. Warren
Joseph G. Cwiklinski	Nelson W. Johnson	William McBride Muir	Maurice Werdegarr
Arthur J. Dagen	Andrew McK. Johnston	Harold D. Noble	Alfred C. Werner
Leo R. Dewhirst	Paul Jureller	Russell J. Nolan	John H. Wolf
Harold P. Dick	Philip E. Kahn	James W. O'Shanecy	Francis X. Woodworth
Clarence A. Dunbar	Arthur L. Kendall	Ernest W. Pilkey	Stanislaus L. Wozniak
James W. Duncan	Clifford J. Kenfield	William E. Prince	Paul W. Zillman
Philo F. Dunning			

Georgetown University, Dental Department.

At the annual commencement exercises of the Dental Department of George Washington University, 1919, held in Washington, D. C., the degree of Doctor of Dental Surgery was conferred on the following graduates:

James W. Brogan	Massachusetts	William C. Hunt	Ohio
Patrick J. Buckley	Massachusetts	Francis A. Kelleher	New York
Maurice A. Casey	Massachusetts	Mathew J. McGuire	Iowa
John F. Clancy, Jr.	Massachusetts	Daniel J. McMahon	Pennsylvania
William V. Connors	Pennsylvania	James F. McSwiney	Massachusetts
Edmund J. Cotter	New York	Grant S. Mackwiz	Pennsylvania
Raymond J. Finnerty	New Jersey	Michael L. Mullaney	Rhode Island
John B. Hanlon	Pennsylvania	James I. Nolan	District of Columbia
Thomas G. Hanlon	New Jersey	William J. O'Connor	Massachusetts
Michael Harris	Rhode Island	Martin A. Stohlman	District of Columbia
Heskett A. Hite	Virginia		

Indiana Dental College.

At the annual commencement exercises of Indiana Dental College, held on June 21, 1919, in Indianapolis, Ind., the degree of Doctor of Dental Surgery was conferred on the following graduates:

Basil V. Ailstock	D. H. Foster	H. W. McFadden	Charles H. Saunders
Sim Aldrich	Louis E. Firemuth	Roscoe McKinney	Reed M. Shroyer
Arthur L. Anderson	Sol B. Freidland	A. Earle May	Cecil T. Seal
Forrest S. Beck	Geo. F. Goldman	K. B. Mayhall	Charles A. Seal
Ford C. Benbow	Chas. E. Goodman	Arthur E. Milligan	C. W. Sibbitt
J. G. Bennett	Guy L. Grant	Allen H. Mitchell	J. C. Sidenbender
John J. Blackwell	Jay W. Hammer	L. H. Moorman	Elmer E. Stearman
Fred G. Bosler	Wm. G. Harlow	Fred Morrison	Alan Stewart
Carl F. Brown	Wm. J. Hendricks	C. W. Negus	W. R. Sumwalt
E. J. Burke	Wm. J. Herr	Theodore E. Nelson	Perry R. Sylvester
C. C. Buyer	Alfred H. Herzog	J. Francis Nevitt	B. E. Talkington
Theodore Cable	Glenn D. Irwin	Carl E. Niemann	Clement W. Tarnowski
Clifford B. Chambers	Sidney F. Jacobi	Walter Wm. Nowak	Richard N. Taylor
Ernest B. Couch	Paul J. Jones	Victor S. Owen	Gordon R. Thomas
J. E. Craig	Eugene Kamm	Herbert Paul	Herbert W. Thompson
Glenn Crim	E. H. Kirchhoff	Frank R. Peters	Maurice D. Thompson
Edward C. Crossen	Karl K. Kraft	Louis H. Rabold	Albert H. Unverferth
Frank Crush	Harris A. Landrum	Eugene C. Ray	Elmer E. Waddell
Gilbert O. Davis	Joseph Lantz	Jean S. Reese	Harry A. Ware
Clarence R. Dimmick	B. Ernest Leachman	R. E. Robbins	Harlen A. Wilson
Russell A. Doudt	Carl Lindemuth	E. J. Rogers	Wm. C. Winkler
Lynn E. Downing	R. C. Lowe	M. Luther Roler	Gayle B. Wolfe
C. E. Eurit	Marion A. McCormick	D. M. Roth	F. F. Worman
Phillips Falender	Clarence V. McCoy	Joseph C. Sampson	Harry A. Young
Geo. Fansler	Paul W. McDaniel		

ARMY AND NAVY DENTAL NEWS

Appointments.

Navy Dental Corps.

The following officers of N. R. F. to be assistant dental surgeons with the rank of lieutenant (Jn.Gr.), for temporary service: Roland W. Quesinberry, Edward J. Noonan, Charles W. Rodgers, Pyrlle A. Fowler, Frank V. Davis, Benjamin F. Loveall, and Walton C. Carroll.

The following-named officers of the N. R. F. to be assistant dental surgeons, with rank of lieutenant (Jn.Gr.), temporary service, from June 15th: C. E. Reynolds, C. S. Weigester, L. B. Lang, C. L. Gorgia, and T. P. Donahoe.

Lieut. A. E. D'Armona, N. R. F., to be assistant dental surgeon with rank of lieutenant (Jn.Gr.), for temporary service, from August 1st.

Lieut. Charles L. Tompkins, N. R. F., to be an assistant dental surgeon, with the rank of lieutenant (Jn.Gr.), for temporary service, from August 15th.

Assignments.

Army Dental Corps.

Week ending August 23d.

Lieut.-col. Minot E. Scott to Canal Zone, for duty as department dental surgeon.

Maj. Elbert E. Rushing to Camp Funston, Kans., for duty.

Capt. Roy R. Newman to Belleville, Ill., Scott Field, for duty.

Capt. Daniel Bratton, Hampton, Va., general hospital 43, for duty.

Week ending August 30th.

Lieut.-col. Herman S. Rush report to commanding general Southern Department for assignment.

Lieut.-col. Frank L. K. Laflamme to West Point, N. Y., military academy, for duty.

Capt. Alvin E. Anthony to Fort Sheridan, Ill., general hospital 28, for duty.

Capt. Harold H. Buehler to Fox Hills, N. Y., general hospital 41, for duty.

Capt. Edwin M. Kennedy to Denver, Colo., general hospital 21, for duty.

Capt. Joseph E. Schaefer to Jefferson Barracks, Mo., for duty.

Week ending September 6th.

Col. Samuel H. Leslie to Camp Pike, Ark., and report for duty.

Col. Robert T. Oliver to Washington, and report to Surgeon-general for duty in his office.

Col. Robert H. Mills and Lieut.-col. Raymond W. Pearson to Camp Gordon, Ga., for duty.

Lieut.-col. John A. McAlister, Jr., to Camp Lee, Va., for duty.

Capt. Lynn H. Tingay to Camp Knox, Ky., for duty.

Capt. William B. Caldwell to Fort Myer, Va., for duty.

Capt. Maximilian P. Bergeron to Fort Des Moines, Iowa, general hospital 26, for duty.

Wm. T. Williams to Camp Zachary Taylor, Ky., for duty.

Week ending September 13th.

Capt. James B. Eastman to Walter Reed General Hospital, D. C., for duty.

Capt. Thomas L. Spoon to Washington for duty in attending surgeon's office.

Capt. Ernest P. Dameron to Jefferson Barracks, Mo., for duty.

Capt. George J. Sibley to Fort Logan, Colo., for duty.

Navy Dental Corps.

Week ending August 15th.

Lieut. W. F. Baron, detached from duty at Wissahickon Barracks, Cape May, N. J.: to duty at navy yard, Norfolk, Va.

Lieut. Sory O. Clayton, detached from receiving ship at New York; to Naval Academy.

Lieut. Alvin D. Ward, detached from 13th regiment of marines; to Quantico, Va.

Week ending August 21st.

Lieut.-commander John V. McAlpin, detached from transport forces, Hoboken, N. J.; to U. S. S. South Dakota.

Lieut. Wm. T. Davidson, detached from U. S. S. Northern Pacific; to marine barracks, Paris Island.

Lieut. Joseph A. Flynn, detached from U. S. S. Manchuria; to marine barracks, Paris Island.

Lieut. Cornelius L. Norris, detached from naval dispensary, Washington, D. C.; to navy yard, Philadelphia, Pa.

Lieut. Louis F. Snyder, detached from U. S. S. Agamemnon; to Naval Academy.

Week ending August 27th.

Lieut. Frederick C. Vosebeck, detached from U. S. S. Rochester; to 5th naval district.

Lieut. James F. McGrath, detached from U. S. S. Dixie; to U. S. S. Buffalo.

Lieut. Robert S. Davis, detached from U. S. S. Michigan; to marine barracks, Paris Island, S. C.

Lieut. Anton C. Tranchina, detached from the Nansemond; to Hampton Roads.

Lieut. Frank B. Ferrill, orders of August 21st revoked.

Week ending September 5th.

Lieut. Wm. F. Hawthorne, detached from U. S. S. Finland; to U. S. S. Rochester.

Lieut. (Jn.Gr.) Patrick A. McCole, detached from Quantico; to receiving ship at Hampton Roads.

Lieut. (Jn.Gr.) H. F. Buchanan, detached from Mare Island; to naval hospital, San Diego.

Lieut. (Jn.Gr.) Clarence A. Stock, detached from naval hospital, San Diego; to navy yard, Mare Island.

SOCIETY NOTES AND ANNOUNCEMENTS

NOTICES should reach the Office of the DENTAL COSMOS *not later* than the 11th or 12th of the month preceding that of publication.

Coming Dental Society Meetings.

With the National Dental Association at New Orleans.

NATIONAL DENTAL ASSOCIATION. New Orleans. October 20th to 24th.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS. New Orleans. October 18th to 20th.

NATIONAL ASSOCIATION OF DENTAL FACULTIES. New Orleans. October 18th to 20th.

NATIONAL ASSOCIATION OF DENTAL LIBRARIANS. New Orleans. October 20th.

AMERICAN ACADEMY OF PERIODONTOLOGY. New Orleans. October 17th and 18th.

AMERICAN SOCIETY OF EXODONTISTS. New Orleans. October 21st.

ASSOCIATION OF MILITARY DENTAL SURGEONS. New Orleans. October 20th to 24th.

CONFERENCE OF PUBLIC SCHOOL DENTISTS. New Orleans. October 20th to 24th.

INTERNATIONAL SOCIETY OF PROSTHETISTS. New Orleans. October 17th and 18th.

DELTA SIGMA DELTA FRATERNITY. New Orleans. October 20th.

PSI OMEGA FRATERNITY, GRAND CHAPTER AND NATIONAL ALUMNI CHAPTER. New Orleans. October 20th to 24th.

XI PSI PHI FRATERNITY. New Orleans. October 20th to 24th.

State Society Meetings.

OCTOBER.

NORTHERN ILLINOIS DENTAL SOCIETY. Rockford. October 8th and 9th.

SUSQUEHANNA DENTAL ASSOCIATION OF PENNSYLVANIA. Scranton. October 8th to 10th.

Examiners' Meetings.

CONNECTICUT DENTAL COMMISSION. Hartford. November 20th to 22d.

ILLINOIS DEPARTMENT OF REGISTRATION AND EDUCATION. Chicago. November 10th to 15th.

IOWA BOARD OF EXAMINERS. Iowa City. October 6th.

MARYLAND BOARD OF EXAMINERS. Baltimore. November 19th and 20th.

MASSACHUSETTS BOARD OF EXAMINERS. Boston. October 6th to 10th.

MISSOURI DENTAL BOARD. St. Louis. October 14th to 16th.

NEW JERSEY BOARD OF REGISTRATION. Trenton. December 1st to 5th.

NEW YORK BOARD OF EXAMINERS. November 11th.

RHODE ISLAND BOARD OF REGISTRATION. Providence. November 4th to 6th.

SOUTH DAKOTA BOARD OF EXAMINERS. Sioux Falls. January 7th to 9th.

TEXAS BOARD OF EXAMINERS. Houston. December 1st to 4th.

National Mouth Hygiene Association.

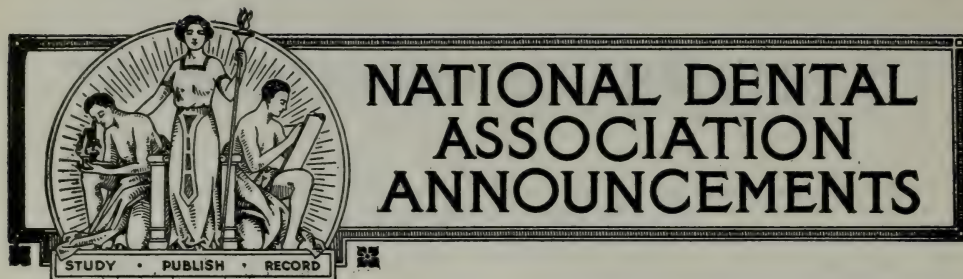
SUSPENSION OF DEPARTMENT OF EXTENSION LECTURES.

THE Department of Extension Lectures and that of Army and Navy Educational Work of the National Mouth Hygiene Association have been suspended.

Applications for Lecture rentals also suspended, and the sale of Lecture "A" sets discontinued.

Holders of Lecture "A" sets may purchase extra slides or manuscripts from Underwood & Underwood, 417 Fifth ave., New York City.

EDWIN N. KENT, D.M.D.,
Director of Extension Lectures,
158 Newbury st., Boston, Mass.



**Twenty-third Annual Meeting, held at New Orleans,
October 20-24, 1919.**

OFFICIAL CALL.

**To the Officers and Members of the
National Dental Association:**

The twenty-third annual meeting of the National Dental Association will be held at New Orleans, October 20-24, 1919.

The House of Delegates will convene at 10.30 A.M., Monday, October 20th, in the Gold Room, Grunewald Hotel.

In the House the representation of the various constituent societies for 1919 is as follows:*

Alabama	271
Alaska	0
Arizona	19
Arkansas	164
Army Dental Corps	350
California State	802
Colorado	223
Connecticut	388
Delaware	0
District of Columbia	122
Florida	179
Georgia	268
Hawaiian Islands	21
Idaho	6
Illinois	2344

Indiana	1046
Iowa	889
Kansas	404
Kentucky	338
Louisiana	137
Maine	112
Maryland	199
Massachusetts	1027
Michigan	923
Minnesota	879
Mississippi	159
Missouri	1067
Montana	144
National Capital	41
Navy Dental Corps	51
Nebraska	421
Nevada	0
New Hampshire	15
New Jersey	604
New Mexico	67
New York	1783
North Carolina	146
North Dakota	296
Ohio	1310
Oklahoma	319
Oregon	277
Pennsylvania	1441
Philippine Islands	1
Porto Rico	0
Rhode Island	122
Southern California	442
South Carolina	261
South Dakota	206

* This roll will be officially revised September 19, 1919.

Tennessee	124
Texas	545
* Trustees	
Utah	133
Vermont	60
Virginia	200
Washington	564
West Virginia	221
Wisconsin	741
Wyoming	34

The scientific Sections of the National Dental Association, the Dental Corps of the Army, the Dental Corps of the Navy, are entitled to one delegate each.

The general meeting, which constitutes the opening exercises of the Association, will be held at 9.45 A.M., Tuesday, October 21st. The various Sections will meet Tuesday, October 21st, at 2 P.M., and subsequently according to their respective programs.

The Registration Department will be open from 8.30 A.M. until 5 P.M. on Monday, Tuesday, Wednesday, and Thursday, October 20, 21, 22, 23, and from 8.30 A.M. to 10 A.M. on Friday, October 24th.

The Registration Office will be in parlor E, second floor, Grunewald Hotel.

C. VICTOR VIGNES, *President*.

OTTO U. KING, *Gen. Secretary*.

Schedule of Trains and Rates to New Orleans.

It is not the policy of the United States Railroad Administration to grant special rates for conventions, and as a consequence we will have no special rates for this meeting, but it has been practically decided that Winter Tourist rates will be placed on sale October 1, 1919, bearing limit of May 31, 1920, from the same territory and at the same rates that were effective last season (90% of full fare). Complete information

* "Trustees shall be members of the House of Delegates, without the right to vote."—*Constitution and By-laws*, Art. V, Sec. 1.

can soon be obtained from your consolidated ticket office or local agent.

Seeing the many advantages of bringing our members together at the most available points, thus enabling them to travel together the greatest possible distance, it has been decided to use the Panama Limited of the Illinois Central, Chicago to New Orleans, on schedule as follows:

Leave

Chicago (Oct. 18th)	12.30	NOON
Kankakee	1.57	P.M.
Champaign	3.28	"
Mattoon	4.23	"
Effingham	4.58	"
Centralia	6.11	"
Carbondale	7.30	"
Cairo	8.33	"
Memphis	1.10	A.M.
Grenada	3.35	"
Canton	5.58	"
Jackson	6.45	"
Hammond	9.45	"

Arrive Sunday, Oct. 19th.

New Orleans	11.15	"
-------------------	-------	---

Members from Boston, New York, Philadelphia, and intermediate points will find desirable train service on the several lines enabling them to make connection with the above at Chicago. The same is true for members from the extreme Northwestern and Northern California territory through Denver, St. Paul, and Minneapolis. Members from Indianapolis, Louisville, and contiguous territory can also avail themselves of connections at various points.

Buy tickets of your local agent, and specify the "National Dental Association train" for your reservations.

Fare from Chicago to New Orleans.

Fare, incl. war tax	\$30.35
Lower berth, incl. war tax	5.94
Upper berth, incl. war tax	4.75
Drawing-room, incl. war tax	21.60
Compartment, incl. war tax	16.74

Trip to Havana—Expenses.

Many inquiries have been received regarding the expense of a trip to Havana, and for the benefit of those interested your committee has compiled the following data:

New Orleans to Havana, one way, incl.

berth, meals, and war tax \$41.00

New Orleans to Havana, round trip (special rate), including berth, meals, and war tax	\$73.40
New Orleans to Havana, thence to New York, incl. berth, meals, and war tax	84.20
Or returning via Key West—Havana to Key West	16.00
Key West to Chicago, via Jacksonville	53.18

Sailing from New Orleans Saturday, October 25th, 48 hours to Havana; complete round trip one week.

Sailings from Havana to Key West daily except Thursday and Sunday. Daylight trip, 11 A.M. to 7 P.M.

Also in this connection will advise that passports and deposits covering reservations are necessary. In addition passengers will be required to carry with them certificates showing full payment of 1917 and 1918 income taxes or exemption therefrom. These may be obtained from the local collector of internal revenue. For further information address F. S. Bishop, C. P. A., 112 West Adams st., Chicago, Ill.

D. C. BACON, *Chairman*
Transportation Committee N. D. A.
31 N. State st., Chicago, Ill.

Leading New Orleans Hotels and Their Rates.

S = Single, without bath. *Sb* = Single, with bath.
D = Double, " " *Db* = Double, " "

GRUNEWALD HOTEL (University Place, off Canal st.): *S* \$1.50, for two \$2.50 and up. *Sb* \$3.00, for two \$4.00 and up, *D*, for one \$2.00, for two \$3.00 and up. (Rms. 500.)

ST. CHARLES HOTEL (St. Charles and Gammon sts.): *S* \$2.00 to \$3.50, *Sb* \$3.00 to \$7.00, *D* \$4.00 to \$6.00, *Db* \$5.00 to \$10.00; parlor, bedroom, and bath \$10.00 to \$25.00 per day. (Rms. 500.)

HOTEL MONTELEONE (Royal and Iberville sts.): *S* \$1.50 and up, *Sb* \$2.50 and up, *D* \$2.50 and up, *Db* \$3.50 and up. (Rms. 500.)

HOTEL DE SOTO (Baronne and Perdido sts.): *S* \$1.50 and up, *Sb* \$2.50 and up, *D* \$2.50 and up, *Db* \$3.50 and up. (Rms. 300.)

COSMOPOLITAN HOTEL (120 Bourbon st.); *S* \$1.00 and up, *Sb* \$2.00 and up, *D* \$2.00 and up, *Db* \$3.00 and up. (Rms. 100.)

LAFAYETTE HOTEL (St. Charles and Lafayette sts.): *S* \$1.50 and up, for two \$2.50 and up, *Sb* \$2.00 and up, for two \$3.00 and up, *Db* (twin beds) \$5.00 and up. (Rms. 80.)

PLANTERS HOTEL (Dauphine and Iberville sts.): *S* \$1.00 and up, *Sb* \$2.00 and up, *D* \$2.00 and up, *Db* \$3.50 and up. (Rms. 75.)

The Program.

PRELIMINARY ANNOUNCEMENT.

IN THE SECTIONS.

Orthodontia and Periodontia.

TUESDAY, 2 P.M.

"An Analysis of the Various Principles of Orthodontic Treatment that have been Advocated during the Last Fifteen Years." By J. A. Cameron Hoggan, Richmond, Va.

"Necessity for Oral Prophylaxis and Radiology in the Practice of Orthodontia." By F. M. Casto, Cleveland, Ohio.

"Observations upon the More Recent Developments in Periodontology." By Arthur H. Merritt, New York, N. Y.

"Why the Field of Prophylaxis is Marked with a Lack of Enthusiasm." By Dorothea A. Howes, Washington, D. C.

WEDNESDAY, 9 A.M.

"Plurality in Etiology of Periodontoclasia." By John O. McCall, Buffalo, N. Y.

"What to Extract, and What Not to Extract, with Reference to Infections Involving the Periodontal Membrane." By Louis D. Coriell, Baltimore, Md.

"An Analysis of Case Characteristics, with Reference to the Selection of the Most Efficient Form of Appliance for Treatment." By A. H. Ketcham, Denver, Colo.

"The Problem of Retention." By C. A. Hawley, Washington, D. C.

Operative Dentistry, Materia Medica and Therapeutics.

FIRST SESSION.

"The Prevention of Chronic Mouth Infection." (Illustrated with stereopticon slides.) By Arthur D. Black, Chicago, Ill. Discussed

by H. E. Friesell, Pittsburgh, Pa.; A. H. Hipple, Omaha, Neb.

[This paper will consider briefly the pathological changes which occur in cases of chronic alveolar abscess and chronic pericementitis, and will then discuss the causes and take up in detail the methods to be employed in operative dentistry for their prevention. Extensive studies of radiographs of root-fillings will be reported, and means of simplifying pulp treatment and root-canal technique will be presented. Particular stress will be laid upon improvements in operative procedures to prevent periodontal infection.]

"X-ray in Dental Practice." By C. Edmund Kells, New Orleans, La. Discussed by H. B. Tileston, Louisville, Ky.; Howard R. Raper, Albuquerque, N. M.

SECOND SESSION.

"Some Recommendations for the Sterilization and Filling of Infected Roots." By Weston A. Price, Cleveland, O. Discussed by Clarence J. Grieyes, Baltimore, Md.; Percy R. Howe, Boston, Mass.

"The Gold Inlay." By R. H. Volland, Iowa City, Iowa. Discussed by Wallace Wood, New Orleans, La.; W. L. Fickes, Pittsburgh, Pa.

Histology, Physiology, Pathology, Bacteriology, and Chemistry — Research.

FIRST SESSION.

"How Mouth Infection Affects the Kidneys." By Thomas B. Hartzell, Minneapolis, Minn.

"A Phase of Dental Caries." By Percy R. Howe, Boston, Mass.

"A Biochemical Study of Bacterial Metabolism in Its Relation to the Denser Tooth Structures." By Samuel E. Pond, Cleveland, Ohio.

SECOND SESSION.

"A Dental Histo-Pathological Study." By Harold Box, Toronto, Canada.

"Physiology and Pathology of Special Interest to Dentists." By J. J. Sarrazin, New Orleans, La.

"Studies of the Variations in Susceptibility to the (So-called) Rheumatic Group Lesions and to the Influence of Oral Focal Infections." By Weston A. Price, Cleveland, Ohio.

Prosthetic Dentistry and Crown and Bridge Work.

Special Announcement.

Owing to the fact that only two half-day sessions can be given to this section, it has been deemed best to dispense with long, exhaustive general papers and discussions, as more definite information can be given by selecting men to cover as many of the vital phases of this branch of dentistry as possible, with a view to standardizing technical procedure. The audience will thus individually have the opportunity of either accepting or rejecting the teachings of the essayists.

In addition to the papers and illustrations, the essayists will give individual clinics in order that those who desire to meet and discuss details further with the clinicians may have this opportunity.

FIRST SESSION.

PROSTHODONTIA.

"Scientific Interpretation of Muscular Control of Mandibular Movements." By Geo. H. Wilson, Cleveland, O.

[The dental profession and anatomists generally are not clear on this subject. Dr. Wilson has been doing research work along this line for some years, and is now ready to present his findings to the profession. Owing to the importance of this subject in its relation to denture construction we are fortunate to have it presented to us by a man of Dr. Wilson's ability and experience.]

"Surgical Interference for Preparation of Malformed Edentulous Mouths for Construction of Dentures." By James P. Ruyl, New York City.

[Demonstrates technique, using motion pictures, for removing protruding gum tissue, irregular alveolar process, and other deformities, in order to simplify complicated cases by providing a firm foundation upon which to build artificial dentures that will be more efficient and more beautiful.]

CROWN AND BRIDGE TECHNIQUE.

"Construction of Cast Clasps for Partial Dentures and General Consideration of Other Methods of Retention and Attachment of Vital Teeth for Removable Bridge Work." By Louis J. Weinstein, New York City.

[Mr. Weinstein's knowledge of the uses and abuses of metals used in dentistry, combined with his technical experience, enables him to present us with definite information on a subject of vital importance at this time.]

"Porcelain Jacket Crown Technique." By A. L. Legro, Detroit, Mich.

[Demonstrates a definite technique for making this most esthetic as well as most valuable prosthetic restoration for the conservation of the dental pulp comparatively simple.]

SECOND SESSION.

PROSTHODONTIA.

"Selection of Artificial Teeth for Prosthetic Restorations." By P. C. Lowery, Detroit, Mich.

[Clearly demonstrates one of the most important phases of dentistry which a large majority of dentists do not seem to appreciate as much as they should. The doctor shows that it is much simpler to harmonize tooth and face form than it is to adapt the face of your patient to your ideal tooth form.]

"Correction of Malocclusion in Artificial Dentures." By M. M. House, Indianapolis, Ind.

[Demonstrates with precision the highest type of efficiency in artificial dentures.]

CROWN AND BRIDGE TECHNIQUE.

"The Gold Shoulder Crown Technique." By Wm. H. Elliott, Detroit, Mich.

[This technique of the most widely used restoration in dentistry is definite, accurate, and simple.]

"Attachments for Vital Teeth in Fixed Bridge Work." By Forrest H. Orton, St. Paul, Minn.

[Dr. Orton's reputation as a technician and teacher of teachable techniques is so great that no dentist can afford to miss an opportunity to hear him lecture.]

"Mandibular Movements and the Forms of Artificial Bicuspid and Molars Necessitated Thereby." By Prof. Alfred Gysi, Zurich, Switzerland.

"Mandibular Control." By J. Leon Williams, New York City.

Oral Surgery, Exodontia, and Anesthesia.

FIRST SESSION.

Symposium on Apicoectomy.

1. "Apicoectomy: Its Indications and Contra-indications, and Root-canal Technique." (Illustrated with stereopticon slides.) By Thomas B. Hartzell, Minneapolis, Minn.

2. "Surgical Technique of Apicoectomy." (Illustrated with stereopticon slides.) By Chalmers J. Lyons, Ann Arbor, Mich.

Discussed by Thomas P. Hinman, Atlanta, Ga.; William L. Shearer, Omaha, Nebr.; Carl D. Lucas, Indianapolis, Ind.; Clarence J. Grieves, Baltimore, Md.; H. A. Maves, Minneapolis, Minn.

"Nitrous Oxid-Oxygen Anesthesia in Oral Surgery and Dentistry." By J. A. Heidbrink, Minneapolis, Minn. Discussed by Wm. H. Deford, Des Moines, Iowa; John W. Seybold, Denver, Colo.; Boyd S. Gardner, Rochester, Minn.

"Tic douloureux; Etiology, Diagnosis, Treatment—Palliative, Blocking, and Surgical." By Rudolph Matas, M.D., New Orleans, La. Discussed by Herbert A. Potts, Chicago, Ill.

SECOND SESSION.

"Impacted Lower Third Molar." (Illustrated.) By Geo. B. Winter, St. Louis, Mo. Discussed by J. P. Henahan, Cleveland, O.; Harry W. Allen, Kansas City, Mo.; O. T. Dean, Seattle, Wash.; Roy S. Hopkinson, Milwaukee, Wis.

Symposium on Nerve-blocking Anesthesia.

"Preparation of Solution." By E. A. Litchfield, Humboldt, Nebr.

"Pharmacology of Various Local Anesthetics." By Samuel L. Silverman, Atlanta, Ga.

"Indications and Contra-Indications." By Fred F. Molt, Chicago, Ill.

"Technique of Nerve-blocking." (The most important injections.) By ———

"Suggestive Therapy and Treatment of Abnormal Conditions During and Following Injections." By P. G. Puterbaugh, Chicago, Ill.

"Diseases of the Antrum." (Illustrated with stereopticon slides.) By Chas. H. Oakman, Detroit, Mich. Discussed by R. Boyd Bogle, Nashville, Tenn.; Truman W. Brophy, Chicago, Ill.

[AT NEW ORLEANS.]

American Society of Exodontists.

THE next annual meeting of the American Society of Exodontists will be held in parlor E of the Grunewald Hotel, New Orleans, October 21, at 8 P.M.

C. F. B. STOWELL, *Sec'y*,
Chicago, Ill.

[AT NEW ORLEANS.]

National Association of Dental Faculties.

THE annual meeting of the National Association of Dental Faculties will be held in parlor E, mezzanine floor, the Grunewald Hotel, New Orleans. The meeting will be called on Saturday, October 18th, at 9 A.M., and will last through Monday.

C. C. ALLEN, *Sec'y*,

[AT NEW ORLEANS.]

American Academy of Periodontology.

THE sixth annual meeting of the American Academy of Periodontology will be held in New Orleans, October 17 and 18, 1919. Headquarters Hotel Grunewald.

An instructive program is being prepared for members as well as all dentists interested in the development of periodontia.

GRACE R. SPALDING, *Sec'y*,
803 Empire Building, Detroit, Mich.

[AT NEW ORLEANS.]

Association of Military Dental Surgeons.

THE Association of Military Dental Surgeons of the United States will hold its annual meeting at New Orleans, October 20 to 24, 1919.

The officers of the Association of Military Dental Surgeons for the ensuing year are as follows: F. P. R. Ryan, president; J. L. Brown, vice-president; R. W. Waddell, secretary-treasurer; Wm. C. Fisher, editor. Council members—John D. Millikin and Wm. C. Fisher.

R. W. WADDELL, *Sec'y*,
New York, N. Y.

[AT NEW ORLEANS.]

National Association of Dental Librarians.

THE National Association of Dental Librarians will meet on October 20, 1919, during the National meeting at New Orleans, La.

Any dentist interested in dental libraries is urged to attend.

A. F. ISHAM, *President*,
Buffalo, N. Y.

G. H. HENDERSON, *Sec'y*,
Chicago, Ill.

[AT NEW ORLEANS.]

International Society of Prosthetists.

THE first annual meeting of the International Society of Prosthetists will be held in New Orleans, La., October 17 and 18, 1919.

Preliminary meetings looking toward the organization of this body were held during the Chicago meeting of the National last year, when the following officers were elected: W. A. Giffen, Detroit, president; Russell W. Tench, New York, treasurer; Dayton D. Campbell, secretary.

DAYTON D. CAMPBELL, *Sec'y*,
Kansas City, Mo.

[AT NEW ORLEANS.]

Conference of Public School Dentists.

A SPECIAL conference of dentists operating in school dental dispensaries and of persons interested in such work is to be held in New Orleans at the time of the National Dental Association meeting, October 20 to 24, 1919.

At a similar meeting held June 13th at Syracuse during the New York State Dental Society meeting, so much interest was shown that a committee was named, and instructed to call this national conference.

All persons interested are requested to extend their suggestions or questions to the committee

WM. H. LEAK, Albany, N. Y., *Ch'man*,
Oral Hygiene Inspector.

N. Y. State Dep't Education.

S. R. MEAKER, Auburn, N. Y.

ERWIN SCHEID, Chazy, N. Y.,

Dental Director, Chazy Central Rural School.

[AT NEW ORLEANS.]

Delta Sigma Delta Fraternity.

THE thirty-fifth annual meeting of the Supreme Chapter of Delta Sigma Delta Fraternity will be held in the Elks' new lodge hall, which is about three blocks from the headquarters of the Fraternity, New Orleans, La., on Monday, October 20, 1919, at 9 A.M.

The regular order of business will be pursued, including action on the proposed amendments to the constitution and by-laws, to be followed by initiatory exercises in the afternoon.

Headquarters of the Fraternity will be in the Grunewald Hotel. The annual banquet will be held in the Elks' new lodge hall at 7 P.M. Those expecting to attend the banquet will greatly facilitate the work of the committee by making their presence known as early as possible on the day of the meeting. By order of the Supreme Chapter.

CARL D. LUCAS, *Supreme Grand Master*,

R. HAMILL D. SWING, *Supreme Scribe*,
1623 Walnut st., Philadelphia, Pa.

Susquehanna Dental Association of Pennsylvania.

THE fifty-fifth annual meeting of the Susquehanna Dental Association will be held at Hotel Casey, Scranton, Pa., October 8, 9, and 10, 1919.

As the members of the association all remember, this meeting was to have been held at the same time and place last fall, but on account of the influenza epidemic it had to be canceled, and it was arranged to be held in October so as not to interfere with the April meeting of the State Society at Pittsburgh.

The executive committee are working out plans to make this the best meeting in the history of the association. It is going to be one of those good old-fashioned meetings that no one can afford to miss.

Further details will follow, but we give you this friendly little tip now—that it is going to be somewhat along the postgraduate line, some of the biggest men in the profession having already been retained. We will make it well worth the trip.

J. P. COULT,

E. L. BROWN,

J. B. TWEEDLE, *Com.*

Northern Illinois Dental Society.

THE thirty-second annual meeting of the Northern Illinois Dental Society will be held at Rockford, Ill., on Wednesday and Thursday, October 8 and 9, 1919.

A cordial invitation is extended to ethical practitioners of dentistry.

R. P. CULVER, *Sec'y*,

DeKalb, Ill.

Marquette University.

THE annual meeting of the Dental Alumni Association of Marquette University will be held on February 11, 12, and 13, 1920, in the Milwaukee Auditorium, Milwaukee, Wis.

V. A. SMITH, *Sec'y*,

Milwaukee, Wis.

Iowa Board of Examiners.

THE Iowa State Board of Dental Examiners will meet for the purpose of examining candidates for license to practice in Iowa, at Iowa City, College of Dentistry, beginning Monday, October 6, 1919, at 9 A.M.

For further information and blanks address

C. B. MILLER, *Sec'y*,

605 Cit. Nat'l Bank Bldg., Des Moines, Iowa.

Massachusetts Board of Examiners.

A MEETING of the Massachusetts Board of Dental Examiners for the examination of candidates for registration will be held in Boston, Mass., October 6 to 10, 1919, inclusive. All applications must be filed, complete, with the secretary ten days before the date of the examination.

For further information address

GEORGE H. PAYNE, *Sec'y*,

29 Commonwealth ave., Boston, Mass.

Missouri Dental Board.

THE next meeting of the Missouri Dental Board for examining applicants will be held at the St. Louis University Dental Department, St. Louis, Mo., Tuesday, Wednesday, and Thursday, October 14, 15, and 16, 1919, examinations beginning at 8 A.M. each day. Application and fee must be in the hands of the secretary at least ten days before examination.

V. R. McCUE, *Sec'y*,

Cameron, Mo.

Maryland Board of Examiners.

THE Maryland Board of Dental Examiners will meet for examination of candidates for certificates in Baltimore, Md., on November 19 and 20, 1919.

For application blanks or further information apply to

F. F. DREW, *Sec'y*,

701 N. Howard st., Baltimore, Md.

Illinois Department of Registration and Education.

THE Department of Registration and Education of Illinois will hold an examination for dentists in Chicago, the week commencing Monday, November 10, 1919. For application and further information, address

F. C. DODDS, *Supt of Registration*,
Springfield, Ill.

Rhode Island Board of Registration.

THE regular semi-annual meeting of the Rhode Island Board of Registration in Dentistry for the examination of applicants will be held in the State-house, Providence, R. I., November 4, 5, and 6, 1919. All applications with proper fee must be filed one week previous. For further information address

E. A. CHARBONNEL, *Sec'y*,

334 Westminster st., Providence, R. I.

Connecticut State Dental Commission.

THE Dental Commissioners of Connecticut will meet at Hartford, November 20, 21, and 22, 1919, to examine applicants for license to practice dentistry, to examine applicants for dental hygienist's license, and to transact other business proper to come before them.

For further information, address

EDWARD EEBERLE, *Recorder*,

902 Main st., Hartford, Conn.

New York State Examinations in Dentistry.

POSTPONEMENT BY THE BOARD OF REGENTS.

Abstract: Because of interference with the course of instruction, caused by the emergent inauguration of the Student's Army Training-corps in connection with dental schools,

* * * * *

it has been formally decided by the Board of Regents to postpone the June dental examination until the first Tuesday of September, and the September examination until the second Tuesday of November.

There was therefore no June dental examination held in this state in 1919, but this will not affect examinations in subsequent years.

AUGUSTUS S. DOWNING,

Assist. Commissioner of Education,
Albany, N. Y.

Texas Board of Examiners.

THE Texas State Board of Dental Examiners will hold its next examination in Houston, Texas, at the Texas Dental College, beginning Monday, December 1, 1919, and continuing through December 4th. The examination fee is \$25, and must accompany all applications. The Texas dental law does not provide for the issuance of a temporary license nor reciprocity with any other state. Applications should be in the hands of the secretary at least five days before the examination.

For further information and application blanks address

HARRISON B. CAVE, *Sec'y*,
Wilson Bldg., Dallas, Tex.

New Jersey Board of Registration.

THE State Board of Registration and Examination in Dentistry of New Jersey will hold their regular examination in the State-house, Trenton, N. J., December 1 to 5, 1919. License fee, \$26, re-examination fee, \$10.

Practical tests required: Insertion of an approximal gold filling with the approximating tooth in position, compound approximal amalgam filling, a silicate filling, practical test of applicant's ability in oral prophylaxis, and preparation of cavity for an inlay with wax pattern. Taking of impression, bite, selection of teeth, articulation, trial plate. Soldering of Richmond crown, which must be made from an impression of the mouth, and the articulating model with the crown, when soldered, must be submitted for inspection. Practical examination in mouth diagnosis.

Attention is directed to the following quotation from the dental law of New Jersey: "Applicant shall present to said board a certificate from the commissioner of education of this state, showing that before enter-

ing a dental college he or she had obtained an academic education consisting of a four-year course of study, or the equivalent thereof." In accordance with this law the secretary will issue application blanks only upon presentation of the required certificate from the commissioner of education, Statehouse, Trenton, N. J.

Applications must be filed complete ten days before the date of the examinations. Address all communications for further particulars to

JOHN C. FORSYTH, *Sec'y*,
435 E. State st., Trenton, N. J.

South Dakota Board of Examiners.

THE next meeting of the South Dakota State Board of Dental Examiners will be held in Sioux Falls, S. D., January 7, 8, and 9, 1920, beginning promptly at 9 A.M. January 7th. All applications must be in the hands of the secretary by January 1st. Fee for examination, \$25; no reciprocity or interchange.

Full information and application blanks may be received by addressing

L. S. SPENCER, *Sec'y*,
Watertown, S. D.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING AUGUST 1919

August 5.

- No. 1,312,117, to JONATHAN G. E. HINKLE. Anesthetic machine.
- No. 1,312,120, to SPENCER M. HURTT. Point for nerve-canals of teeth.
- No. 1,312,141, to WILLIE F. SLACK. Artificial tooth.
- No. 1,312,270, to PERCY RUSSELL. Dental implement.
- No. 1,312,334, to EMANUEL LOEWENHERZ. Tooth-cleaning device.

August 12.

- No. 1,312,896, to LAURENCE F. DONNELLY. Combined toothbrush and dental floss holder.
- No. 1,313,031, to GILBARDO VELILLA M. Dental appliance.

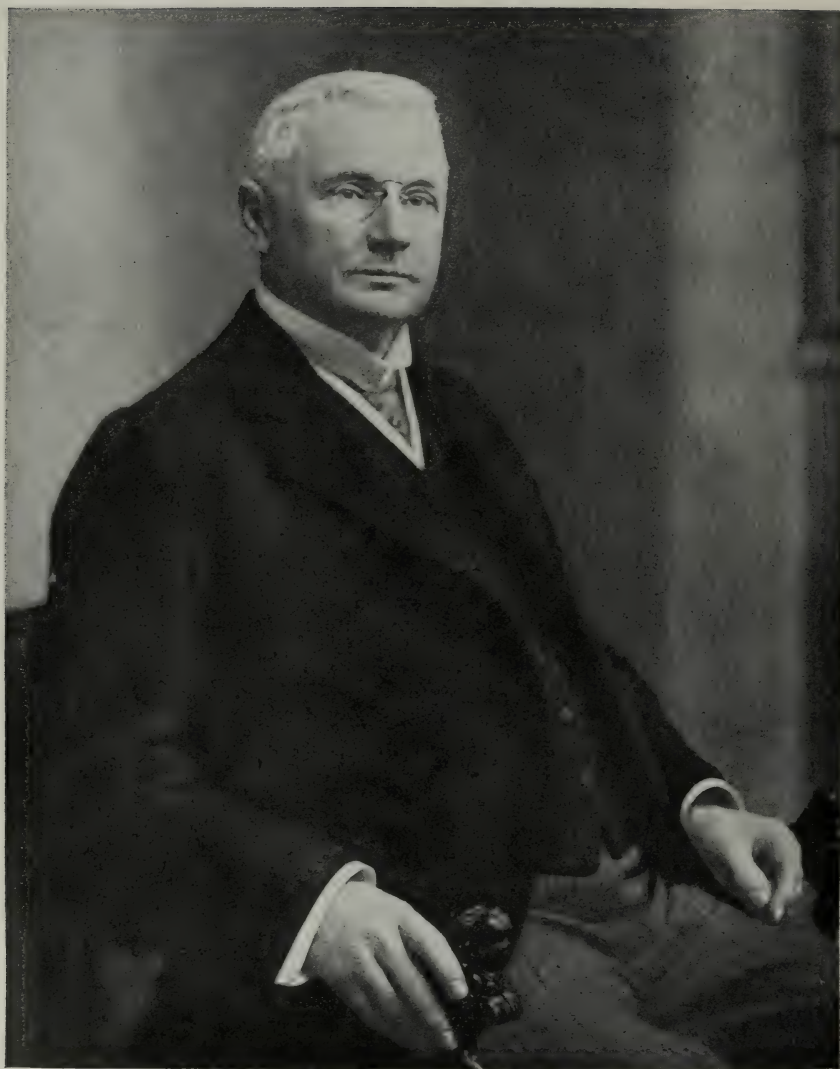
August 19.

- No. 1,313,528, to GEORGE WM. DOVER. Method of making false teeth backings from sheet metal,

- No. 1,313,861, to J. E. REID & F. W. SIDE. Hot-air dental syringe.
- No. 53,715, to EDWIN J. SAMSON. Design for toothbrush.
- No. 126,275, to FAWCETT & FAWCETT. Trade-mark for certain named dental, medical, and surgical appliances.
- No. 126,349, to LEE S. SMITH & SON MFG. CO. Trade-mark for dental enamel.
- No. 126,371, to H. B. WIGGIN'S SONS CO. Trade-mark for plaster of Paris for dental, medical, and surgical purposes.

August 26.

- No. 1,313,907, to JACOB PETRY. Method of making dental molds.
- No. 1,314,125, to GILDEROY O. BURLEW. Dental abrasive or grinding disk.
- No. 1,314,223, to EMIL SORESENSEN. Dental parallelometer.
- No. 1,314,224, to EMIL SORESENSEN. Anchor for removable bridges for teeth.
- No. 126,438, to Dr. T. J. KING-CLARENCE W. KING, D.D.S., INC. Trade-mark for mouthwash.



Maxwell Sill Jenkins.

THE DENTAL COSMOS

VOL. LXI.

NOVEMBER 1919.

No. 11

ORIGINAL COMMUNICATIONS

Multiple Infection: A Study of Relationship Between Infections.*

By WM. W. DUKE, M.D., and REX L. DIVELEY, M.D., Kansas City, Mo.

ONE of the important advances of the past decade in the science and practice of medicine has been the development of our knowledge concerning the rôle which disease in one organ plays in the etiology and pathogenesis of disease in other organs. The best interests of the patient demand now more than ever that the specialist in deciding upon a given procedure consider both the effect which the local disease he may be treating exerts upon disease in other organs, and the effect which disease in other organs may have upon the local condition. The recent advances in dentistry have brought this field of work into very close relationship with that of general medicine. It has become necessary for the physician to take into account the condition of the teeth in

the handling of a large variety of medical cases. It is almost equally necessary that the dentist make a careful inquiry into the general condition of the patient before deciding upon his dental procedure, for some systemic diseases urgently indicate the need of thorough and radical dentistry, while under conditions of good health the more conservative measures may be preferable. Furthermore, many conditions lower resistance to infection and not only render oral sepsis more harmful than it is in the case of healthy individuals, but also make it more difficult to cure and more prone to recur. Thus from two points of view the need of the more thorough and radical measures may be indicated. The failure of careful laborious conservative dental measures in cases which

* A portion of the subject matter in this article has been reported previously by one of us in a monograph, "Oral Sepsis in its Relationship to Systemic Disease," and in the *Journal of the American Medical Association*, No. 23, 1918, vol. 71, pp. 1703-06.

would appear locally to be favorable for treatment may frequently be accounted for by the fact that an individual's resistance is low, and in such persons infections of any kind, including the oral, are slow to heal and prone to recur.

It is for the purpose of discussing an interesting medical phase of oral sepsis that the writers have taken the liberty of publishing an article in a dental journal. Their views are based upon an experience with a large number of carefully studied medical cases, observed in consulting office practice, in which cases dental films were taken as a routine measure. In all, more than twenty thousand films were examined. In the majority of these the patients were seen both before and after dental procedures were carried out, and the effect upon the patient's general health could be observed.

A dentist sees two classes of patients, namely, healthy individuals and sick people; the patients who consult a physician are usually ill. For this reason the advice given to the average patient by a physician is usually more radical so far as the cleaning up of sepsis is concerned than that given by a dentist. This does not necessarily mean, however, that the physician disapproves of conservative measures in healthy individuals if such measures can render an infected tooth innocuous, nor that he fails to appreciate the value of a tooth. It means rather that he has examined the patient, and when serious systemic ills are found is anxious primarily to safeguard the health.

LOWERED RESISTANCE.

Resistance to infection may be lowered by a large variety of diseases and conditions. For example, by chronic alcoholism, drug habits, diabetes, nephritis, circulatory diseases, anemia, and other blood diseases, diseases of the ductless glands, lead poisoning, scurvy, the therapeutic use of mercury and potassium iodid, pregnancy, lactation, senility, overwork, lack of proper nourishment, debilitated conditions of any sort due to dis-

ease, lack of proper nourishment, faulty methods of living, etc. In patients having the above diseases, oral and other forms of sepsis are a greater menace to health than is the case with normal individuals, and are also more difficult to cure.

Resistance to infection may be lowered by another class of disease not mentioned in the list above, but which is equal in its importance, namely, by infection itself. It is with this class of cases that the writers wish to deal in detail in this paper.

INFLUENCE OF ONE INFECTIOUS DISEASE UPON ANOTHER.

It is now more or less generally recognized that if a person has two or more infectious diseases, one may influence the other, occasionally to the apparent advantage of the patient, but more frequently to his disadvantage. In other words, resistance to one organism may occasionally be increased by infection with another, but usually the reverse is the case, *i.e.* resistance to one organism is lowered by infection with additional organisms. This subject has been dealt with briefly in the literature under such titles as mixed infection, secondary infection, and focal infection, but not to the extent which it deserves. The fact has been mentioned particularly by physicians specializing on tuberculosis, who emphasize the fact that latent tuberculosis may become active and rapidly progressive after an attack of influenza, tonsillitis, measles, pneumonia, or of other acute infectious diseases; also by the army medical corps, who almost unanimously recognized that acute infections following such maladies as measles, mumps, influenza, etc., were more than doubly serious. Osler mentioned in some of his earlier writings that quiescent maladies, such as congenital syphilis and tuberculosis, may be lighted into activity by vaccination against smallpox.

Our friend Dr. Paul M. Krall, while in the army medical corps, found experimentally, by injecting mixtures of a culture of streptococcus and gas ba-

cillus into guinea-pigs, that a dose of gas bacillus which was too small to cause noticeable symptoms when given alone was quickly fatal when mixed with streptococci.

One of us has been interested in this subject for a number of years, and has observed many and varied examples of latent and chronic infection becoming acute and severe after an attack of acute infection of a totally different nature. For example, in one patient a urethral discharge in which gonococci were abundant was noticed a few days after a severe attack of tonsillitis. The patient gave a history of having had urethritis several years previous, but since that time had apparently been well and had not been exposed to fresh infection. Chronic cystitis of a mild type may become very severe following an attack of diarrhea, cholecystitis, appendicitis, or tonsillitis. Latent syphilis may become active following an acute febrile disorder. A patient with this disease who had been thoroughly treated by one of us and who apparently had been well for several years was covered with a copper-colored papillary rash and gave a positive Wassermann test at the end of the first week of convalescence from typhoid fever. Another somewhat analogous example was that of a patient who had an attack of pneumonia following an acute alveolar abscess. Several weeks later he had a recurrence of pulmonary tuberculosis that had been latent for many years and had not interfered with a most active mental and physical life.

RELATIONSHIP BETWEEN CHRONIC INFECTIONS.

Chronic infections of a milder nature may also have a deleterious influence on other infectious diseases with which a person may be afflicted. This influence is often quite marked. The ill effect of chronic infections of the nose and throat on persons with tuberculosis is generally recognized, and proper local measures for the cure of these are looked on as an important part of the *régime* for treating tuberculosis in many institu-

tions. Oral sepsis may have an important influence on tuberculosis, and the eradication of oral sepsis may be of material value in arresting the disease.

Staphylococcal infections of the skin, such as acne and furunculosis, according to Sutton, are often more amenable to treatment after the eradication of infected tonsils, alveolar abscesses, etc. In a patient observed by the writers with staphylococcus aureus septicemia of more than two months' duration the temperature fell to normal a few hours after the extraction of an infected tooth, and remained normal for ten days. The case eventually ended in complete recovery. The roots of the tooth showed streptococcus viridans in almost pure growth when cultures were taken, while repeated cultures of the urine and two blood cultures gave a growth of staphylococcus aureus.

One chronic mild infection may influence the course of other chronic mild infections. For example, tonsils that appear to be chronically inflamed often become smaller and appear relatively normal after the eradication of severe oral sepsis. Chronic infection of the nasal sinuses may often be reduced in severity or to apparent quiescence by the removal of infected tonsils or alveolar abscesses. Symptoms of mild infection in the gall-bladder are often relieved to a marked extent by the removal of apparently trivial infections in the nose, throat, or mouth. A patient observed by the writers, who had been subject to recurrent attacks of slight jaundice associated with slight fever and pain in the region of the gall-bladder for several years, and who refused operation, was apparently relieved permanently by the extraction of one abscessed tooth. An analogous example of greater interest to dentists, perhaps, is that of a patient who was subject to repeated attacks of gingivitis which had caused a moderate grade of destruction of the gum margin. The attacks were difficult to account for, because the teeth were regular, occlusion nearly perfect, and he had only one small filling in a nearly perfect set of teeth. This recurrent inflammatory process had

resisted careful treatment by a capable dentist until an abscess, pyorrheal in origin, was discovered about one of the molars. When this tooth was extracted the gingivitis disappeared practically without treatment and the patient's general health improved. Persistent cases of pyorrhea often yield more rapidly to treatment after the removal of chronically infected tonsils or after the extraction of abscessed teeth. Numerous similar examples with which careful observers are familiar could be mentioned.

CHRONIC SEPSIS AND THE SYMPTOMATOLOGY OF SYPHILIS.

It seems worth while at this point to make especial mention of the relationship between oral sepsis and the symptoms of syphilis, for anti-specific treatment has a decidedly deleterious influence on infections about the teeth; on the other hand, oral sepsis has an influence upon the course of specific disease which is so marked that physicians who neglect it are not accomplishing the maximum amount of good in their therapy. Syphilis and severe oral sepsis is an unfortunate combination of diseases unless each disease is taken seriously and handled energetically. Mercury and potassium iodid in therapy make oral sepsis advance, as is well known. Often a slight case of pyorrhea due to defective dental work and a few apparently trivial apical infections will get worse and lead to marked suppuration at the gum margin and to large and even painful abscesses soon after intensive therapy with mercury is started. It may be said in passing that here more than in almost any other disease a radical and thorough clean up of mouth infection is indicated. The point with which we wish to deal in detail, however, is the fact that oral sepsis as well as other forms of chronic sepsis makes the course of syphilis, especially syphilis of the nervous system, more rapid and more serious. It may be exemplified by the following two brief case reports:

(1) A man, age fifty, with tabo-paresis, had been given thorough anti-specific treat-

ment for years. When he came under our observation he was unable to attend to business, and spent most of his afternoons in bed. All known methods of treatment had been pushed to the limit, and it appeared that very little improvement could be expected from further anti-specific measures. The patient had large tonsils and several abscessed teeth. These were removed, whereupon the patient improved steadily and to an unbelievable degree. Within less than a month he was able to engage in business again. He has continued anti-specific treatment and has remained in active business since that time.

(2) A man, age forty-five, was brought in with a diagnosis of early tabes dorsalis. Physical and laboratory examination left no doubt concerning this. The onset had been stormy, and for three weeks the patient had been fairly convulsed with darting pains and had hardly been able to control himself. He was so nervous and irritable at the time of the examination that it was almost impossible for him to remain quiet long enough to permit a specimen of blood to be obtained for examination. Lumbar puncture could not have been performed without general anesthesia. The teeth showed an advanced degree of sepsis. The abscessed teeth were all extracted. Within a few days the patient's condition was so much improved that he went back to work. He felt and acted like a well man, even though anti-specific treatment had not yet been administered.

Many cases similar to the foregoing could be cited. These are not unusual cases, but represent almost an average experience with early cases of tabes dorsalis in patients who have severe oral sepsis.

ALLERGIC REACTIONS.

The problem of multiple infection and the relationship which one infection bears to another is deeper and of greater interest than the simple fact that a person bombarded by two infections is worse off than if he had only one. One infection has an interesting relationship to other infections with which a person may be afflicted, and may be explained in part at least through phenomena described under the terms allergy, protein sensitization, and anaphylaxis.

A true toxin is not formed by any of the micro-organisms that ordinarily take part in the pathology of infection in human beings, with the exception of tetanus and diphtheria bacilli. Killed cultures of all other organisms or extracts of the organisms, or the culture medium in which they have grown, may be injected in large quantities into healthy guinea-pigs without immediate gross ill effect. They differ strikingly in this respect from tetanus and diphtheria bacilli, each of which produces a true toxin that is poisonous in a high degree when administered subcutaneously, even in very minute doses, to animals. The products formed by other organisms that cause disease may be extremely toxic, however, through an entirely different mechanism—namely, the development in an individual of a condition known as allergy. This term, introduced by Pirquet, is used to designate the changed condition of human beings or animals caused by infectious diseases or produced by inoculation with alien proteins, which causes the individual to react in a peculiar way if the bacteria responsible for the infectious disease or the protein with which he may have been inoculated is reintroduced into the circulation. The ensuing reaction is in some respects protective and beneficial, but in other respects may be harmful and even dangerous.

Allergy and its effects are well illustrated by the action of tuberculin. Killed tubercle bacilli or their extracts, or mediums in which tubercle bacilli have been grown may be injected in large amounts into normal untreated animals without gross immediate ill effects. If even minute quantities are injected into animals or persons with tuberculosis, however, the effect is entirely different. Instead of its being apparently inert it causes a reaction which may result quickly in death. The changed condition of the animal produced by the tuberculin injection which renders it sensitive to the products of tubercle bacillus is the condition known as allergy. Several striking phenomena follow the introduction of tuberculin into tuberculous per-

sons or animals which never appear in the non-tuberculous. These are, first, pain, swelling, redness, and sometimes necrosis at the site of inoculation. This is known as the local reaction. Second, a rise in temperature and pulse rate and general symptoms of toxemia, which phenomena are known as the general reaction. Third, inflammatory changes at the site of all active tuberculous lesions. This phase is known as the focal reaction. This last phase is very interesting and may be used in explaining many of the phenomena observed in multiple infection, as will be mentioned subsequently. Focal reactions may be slight or may be well marked. In tuberculous individuals it may hasten the breaking down of tuberculous tissue and lead to rapid spread of the disease.

Some persons with tuberculosis become so sensitive to products of the tubercle bacillus that amounts of tuberculin as minute as 0.001 mg. are sufficient to produce reactions and to cause local inflammatory reactions at the site of all active tuberculous lesions. Others tolerate larger amounts. A reaction as described above can be produced in tuberculous animals by subcutaneous injection of living tubercle bacilli as well as by extracts of the organisms. If tuberculous guinea-pigs are inoculated with living tubercle bacilli, a local and general reaction results within a few hours essentially similar to the reaction produced by the extracts of dead bacilli. A focal reaction may also ensue which will make every active tuberculous lesion in the animal temporarily worse. If non-tuberculous animals are similarly inoculated, no such reaction ensues, but the animal after a period of days or weeks becomes ill and dies of tuberculosis. If a localized tuberculous lesion in human beings (such as a tuberculous joint) is subjected to massage and manipulation, living tubercle bacilli or their products gain entry into the circulation, and a transitory rise of temperature and other symptoms of a general reaction may follow. This may be associated with an increase in the inflammatory reaction (focal reaction) at the site of all other active tuberculous

lesions with which the individual may be afflicted.

The foregoing well-known facts regarding tuberculous infection and the sensitization produced by it are true of infection in general. An attack of typhoid, for example, renders one sensitive to the typhoid bacillus, or of furunculosis to the staphylococcus aureus, so that persons having these diseases usually show local, general, and focal reactions if they are inoculated with killed cultures of the offending bacteria. This may temporarily increase the severity of the infection, the degree of which depends to a certain extent on the quantity of bacteria injected.

Persons with chronic furunculosis may give a general reaction within a few hours if they are inoculated with an excessive quantity of killed staphylococci, and the furuncles may become temporarily worse. Such persons react similarly when they are subjected to the effect of an increased number of living bacteria due to the development of a fresh furuncle. This often causes both a general and a focal reaction. For example, with the development of a fresh furuncle there may appear fever, malaise, etc. (general reaction) and exacerbation in the inflammatory process in recent furuncles (focal reaction).^{*} In fact, signs of activity, such as itching and redness, may appear in the scars of recently healed furuncles. This may be followed by a discharge of pus containing staphylococcus aureus. These well-known principles are true of infection in general, and can be invoked in the explanation of many phenomena. It often explains the reason why with the onset of a new infection signs of irritation and inflammation may appear within a few hours at remote points.

The relationship of allergy to oral sepsis is interesting from two points of view. First, from the standpoint of the influence which other infections play on oral sepsis; second, from the standpoint of the influence which oral sepsis has on infections located in other parts of the body. For example, if an individual has oral sepsis or recently treated or appar-

ently cured oral sepsis, what would be the effect of an attack of acute streptococcic tonsillitis or sinus infection or gall-bladder infection upon the gums? Theoretically, an allergic reaction could occur in the gums which would give all the clinical signs of recurrence of the disease and could cause recurrence of the disease. Practically it might be said that this very thing often occurs. One patient observed by the writers who was subject to recurrent attacks of gingivitis could attribute nearly every attack to a cold followed by frontal and ethmoid sinus infection. It was mentioned in a previous paragraph that a patient subject to attacks of gingivitis was apparently relieved by the extraction of an abscessed tooth. It is believed that slight flare-ups in the alveolar abscess caused focal reactions at the gum margin and led to the recurrences mentioned. The following case illustrates the grave symptoms which this phenomenon may cause:

A woman, age sixty, relatively normal for her age, had ten infected teeth extracted. Less than twenty-four hours afterward there developed a severe acute follicular tonsillitis. Several days later the infection began to spread from the gums to the cheeks, pharynx, and tongue, and gave rise to an extensive ulcerative stomatitis. Several days later still the infection became general and a fatal septicemia resulted. [The point which we wish to emphasize here is the fact that the inflammatory reaction in the tonsils, while relatively distant from the gums, occurred within a few hours, and preceded by several days the infection of the adjacent tissues of the gum and cheek. Infection of the tonsil by organisms disseminated from the alveolar process could not have occurred in so short a time. The attack of tonsillitis must have been a focal reaction in tonsillar tissues sensitized by the organisms already localized there. It was analogous in every way to the focal inflammatory reaction in the lungs that may be brought about in tuberculous individuals by the injection of an overdose of tuberculin. The spread of the infection several days later to the mucous membrane of the mouth, etc., was a different phenomenon—probably a fresh infection of relatively normal tissues.]

It is by no means uncommon to observe pain in the region of the gall-

bladder, appendix, stomach, joints, cervical glands, etc., a few hours after the extraction of infected teeth. Such disturbances may frequently be interpreted as focal reactions caused by the traumatic dissemination of micro-organisms or their products from the alveolar process.

Frequently the clinical manifestations of chronic appendicitis, cholecystitis, gastric and duodenal ulcer, chronic arthritis, etc., clear up rapidly after the extraction of diseased teeth, even though the first effect may have been an increase in the inflammatory processes. Occasionally, chronic inflammatory conditions that appear to indicate the need of surgical interference and serious internal diseases that cannot be reached by therapeutic agents, partially or wholly clear up symptomatically after as simple a procedure as the extraction of a tooth or the removal of a pair of diseased tonsils. The relief can often be attributed to the fact that sources of bacterial products that have been continuously causing focal reactions in the infected organs have been removed.

NON-SPECIFIC REACTIONS.

This explanation applies very nicely to multiple infection when each lesion is caused by the same micro-organism; it may or may not apply in part to multiple lesions caused by different micro-organisms. This question is an open one about which much might be said. For example, if a person has streptococic tonsillitis, and a latent streptococic infection in the joints and in the gall-bladder, it would be in harmony with accepted theories if an acute exacerbation of the tonsil infection were followed in a few hours by a reaction in the joints and gall-bladder that caused pain and other phenomena of a focal reaction. This explanation, as was previously mentioned, would not apply in the same way to multiple infection if the various lesions were caused by different micro-organisms, because sensitization against the protein of an infecting organism is thought, and we believe correctly so, to be more or less specific. Whatever the theoretical explanation may be, we have this fact,

which is beyond dispute: Infection with one micro-organism may lower the resistance against other micro-organisms to a degree that is by no means negligible. We dealt with this above and mentioned clinical examples. One further illustration even more striking may be added here:

A patient, age thirty-five, apparently in good health, had a severe attack of erysipelas, evidently streptococic in origin. A few days after this a very insignificant pustule no more than 2.5 mm. in diameter which showed staphylococcus aureus on culture began to spread with great rapidity, and within a few days gave rise to an extensive phlegmon which persisted for two weeks. In this instance the streptococic infection certainly had lowered resistance against staphylococcus aureus.

There apparently exist two types of immunity—a specific immunity and a non-specific immunity. Non-specific immunity has been made use of in the cure of disease by Miller and Lusk, Jobling and Petersen, and others, who have injected alien protein of different types (including killed typhoid bacilli) in the treatment of arthritis and other infectious diseases. While the results obtained were not invariably a complete success, they were sufficiently striking to warrant the observers in concluding that non-specific immunity is often an important factor in the cure of disease. The inoculation of infected persons with an alien protein, such as typhoid bacilli or albumose, may cause general reactions that render the patient's condition temporarily worse. Often it also causes focal reactions in the infected areas. For example, in persons with arthritis the joint pains may often be more severe a few hours after the intravenous injection of typhoid bacilli. Persons with tabes dorsalis frequently have sharp, darting pains in the legs after similar intravenous injections. The reactions that are produced by the injection of alien proteins are often very similar to reactions that follow inoculation with the specific organism that causes the patient's disease. It is not inconceivable that frequently repeated inoculations with a non-specific virus might cause repeated reactions in

inflammatory lesions due to other organisms, and in this way do harm and cause an exacerbation of the disease. It is possible that one infection may exert a deleterious influence on lesions caused by other micro-organisms in some such way as this, and might in part explain the cure of one infection by the removal of another infection in no wise related to it.

SUMMARY AND CONCLUSIONS.

This paper has been written because of its practical bearing on the handling of chronic infection. Whether or not the explanations given are correct, this fact stands, we believe, beyond dispute:

In persons having several infections each infection may increase the severity of the others whether due to the same or different organisms.

In its relationship to oral sepsis one can say, we believe, both that chronic infections of widely varying types may have a deleterious influence on oral sepsis and render it difficult to cure and prone to recur, and also that oral sepsis may increase the severity of other chronic infections localized in other organs, whether due to the same or to totally different organisms.

This is a matter of considerable importance to both dentists and physicians in the treatment of medical cases, for the majority of cases consulting a physician have not one chronic infection, but as a rule have two or more.

Tabulation of one thousand medical cases examined by the writers on account of miscellaneous systemic complaints gave the following results: Sources of chronic or frequently recurrent infection were found in 97 per cent. This included active tuberculosis, syphilis, chronic gastro-intestinal disorders due to abnormalities in the appendix, the gall-bladder, to gastric or duodenal ulcer, extreme ptosis, adhesions, chronic infection in the respiratory tract, genito-urinary tract, etc. A marked degree of oral sepsis was seen in roentgenograms in 66 per cent. In 34 per cent. either none was found or the amount was slight. Diseased tonsils appeared to have been

possible sources of disease in a large percentage of the cases. The exact percentage is not given because of the inaccuracy of the methods of determining that a given tonsil is free of disease. Sixteen per cent. of the cases gave a history of chronic nasal discharge or showed deviation of the septum, spurs, polypi, or other abnormal conditions in the nose. In a minority of these were found tenderness over the frontal, ethmoidal or maxillary sinuses, or shadows indicating infection past or present were disclosed by the X-ray. Sixteen per cent. of the cases had digestive disturbance or other symptoms associated with tenderness in the right iliac fossa. A minority of these cases were thought to have an abnormal appendix. Seven per cent. had symptoms which appeared attributable to the gall-bladder. In addition, a relatively large percentage had digestive disturbance due to either appendix or gall-bladder disease, which could not definitely be diagnosed, or due to adhesions, extreme ptosis, gastric or duodenal ulcer, etc. Eleven per cent. gave positive Wassermann tests. Blood sent in for examination because of suspected syphilis was excluded from these statistics. In over half of these (6 per cent. of the total number of cases examined) syphilis of the central nervous system was suspected clinically and verified by lumbar puncture. In 7 per cent. the presence of active tuberculosis was positively demonstrated. A miscellaneous group of infections was found in a number of cases. A majority of the cases had more than one infection. Of the 66 per cent. having a considerable degree of oral sepsis, 72 per cent. had other chronic infections in addition. In but 18 per cent. was oral sepsis the only active infection found.

In the practice of medicine one is confronted with three classes of chronic infection: First, those which can be completely cured or removed (such as oral sepsis, chronically infected tonsils, or chronic appendicitis). Second, those which can be removed only with difficulty or with a degree of danger or distress to the patient (such as chronically in-

fectured gall-bladder or ethmoid sinuses). Third, those which cannot be removed or completely cured (such as the advanced stages of chronic nephritis, myocarditis, tabes dorsalis, or tuberculosis), and have to be treated with palliative measures and protected from further injury if possible.

The most favorable medical cases for dental treatment are those of the first class, for in them each infection can be removed or cured. The treatment of oral sepsis in the second and third classes

is important, however, for frequently it offers a simple and safe means of helping a medical or surgical condition which might otherwise progress or be difficult to combat either medically or surgically. It frequently is the case with individuals having several infections that some seem trivial and others serious or untreatable, and that frequently if the trivial conditions are all carefully taken care of, the more serious ones take care of themselves.

WALDHEIM BLDG.

Histo-pathology of the Jaws and Apical Dental Tissues.

No. IV:

Degenerate Root Structures.*

By EUGENE S. TALBOT, M.D., D.D.S., Chicago, Ill.

ALL are doubtless familiar with my researches in the past thirty-eight years upon the subject of degeneracy and degenerate structures of the human body. The reports of this work have appeared from time to time in book form as well as in monographs. After years of study I was able to work out a comprehensive law governing this subject, with illustrations showing its action. In my work upon "Developmental Pathology: A study in Degenerative Evolution,"^a I demonstrated that every individual as well as every structure or

organ of the human body passed through lower vertebrate types from fish to reptile and from bird to mammal in his development from the primitive cell. When arrest of the human type occurs it is called arrest in ontogeny. Arrests of organs or structures resembling lower vertebrate forms, namely, fish, reptile, bird, or mammal, are called arrests in phylogeny. Owing to an unstable nervous system in the mother or child, or from child diseases after birth, arrests of development frequently occur at periods of stress, which periods occur at intervals throughout life. A period of stress is that time in the development of a human being or animal when certain structures are lost

^a Published by Richard G. Badger, Boston, Mass.

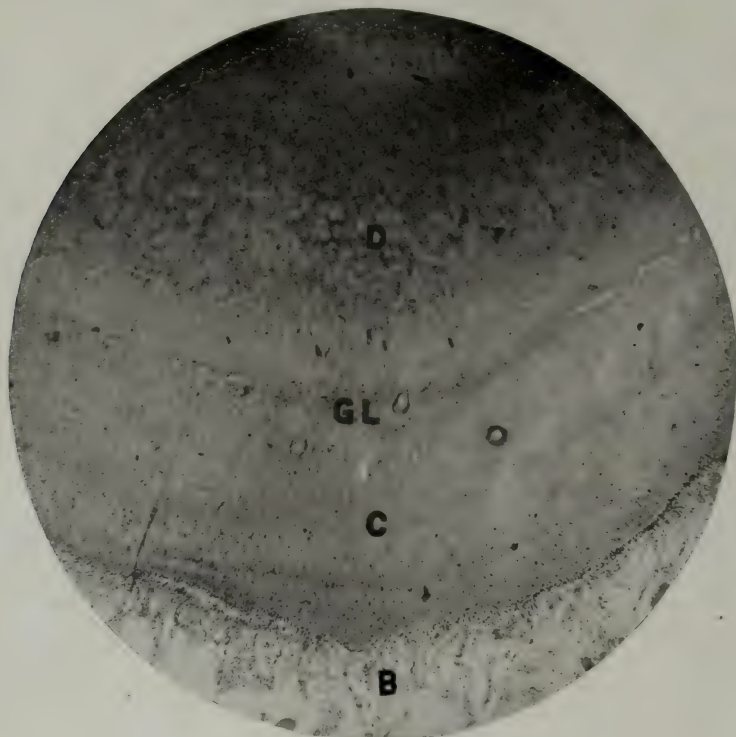
* The subject intended for this paper, "The Granular Layer of Tomes," was selected some years ago in a series taken from textbooks as a guide for my researches. I have again and again alluded to this matter in former papers. When I began my studies of this subject I found that what the textbooks called the granular layer did not exist. There are sometimes found deficiencies in structure in the development of the dentin near the enamel in the crown and near the cementum of the root which are apparent to all dental microscopists. This paper does not touch upon the so-called granular layer of Tomes.

and others are gained for the benefit of the organism as a whole. The first period of stress is *in utero*, when all structures of the body are forming. The mother alone is responsible for the development of normal tissues. If the mother is tired out from any cause or if she is not properly nourished, the ner-

from this general rule. In article No. II, in the September 1919, DENTAL COSMOS, I demonstrated two different forms of arrest in arterial development in the tooth root, one an arrest at the fish type and the other at the reptilian type.

In this paper I shall continue my researches in root degeneracies.

FIG. 1.



(Magn. 40.)

vous system becomes unstable, and some of the tissues or organs or even the child itself will become arrested in its evolutionary development. The other periods of stress occur after birth at the development of the first teeth, at the eruption of the second teeth, at puberty, senility, etc.

Some of these arrests, however, like those of the face, jaws, and teeth, which occur after birth, received their impulse *in utero* at the first period of stress.

It seems that the teeth are not exempt

In studying histology under the microscope, it is often difficult to decide where histology stops and pathology begins. We have now reached such a point. The structures to be shown in the following illustrations, whether they may be considered histologic or pathologic, must be discussed at this time because they are intimately connected with the external layer of the epithelium and so-called Nasmyth's membrane. I stated in article No. III in the October DENTAL COSMOS, entitled "Epithelial Débris Lo-

cated in the Peridental Membrane and Other Structures," that in the development of the tooth root, the external epithelial layer might end at any locality—at the neck of the tooth, extending one-third, two-thirds, or the entire distance around the root, while in molars it might extend around two or three roots, accord-

regardless of length, is brought closely in contact with the outer surface of the dentin by the contraction of the fibrous sac.

If the external epithelial layer extends below the neck of the tooth upon the root, there can be no attachment of the epithelial cells to the dentin. There can

FIG. 2.



(Magn. 6.)

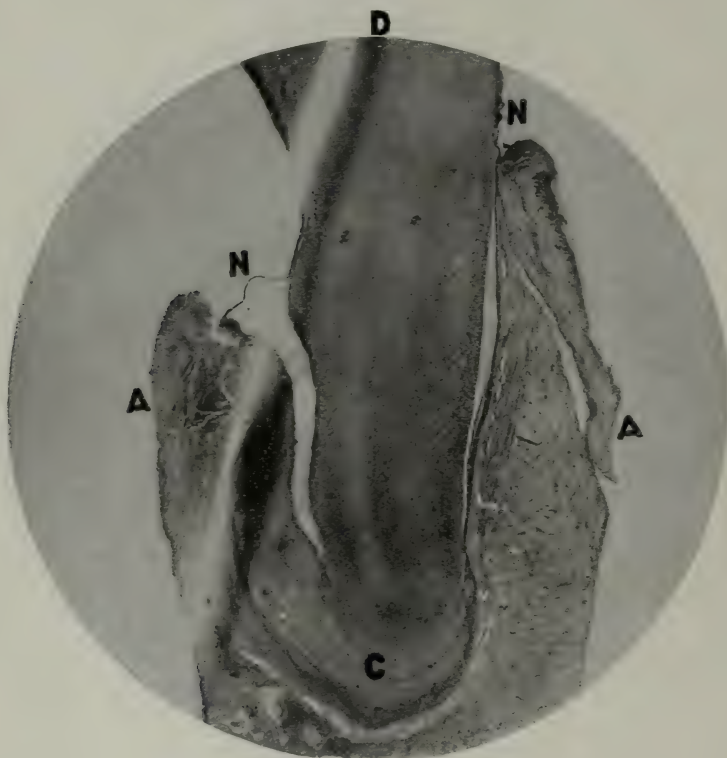
ing to its length. There is no reason to doubt that the epithelial layer when properly nourished might grow in length, if too short to encircle the root at the time it severed itself from the inner layer after the enamel had completely formed. The epithelial cord grows in length, and epithelial cells multiply and grow in fibrous tissue; why not the external epithelial layer? At any rate, before the cement is deposited the epithelial layer,

be only a loosely constructed structure, which naturally assists in forming degenerate structures. This loosely constructed structure may consist of fine spaces located within the entire distance around the surface of the dentin, or larger cavities may be seen at intervals, due to looping of the epithelial layer; or only one large cavity may be located at some point along the tract, caused by the fact that the cells do not lie flat

against the dentin, and the balance be made up of a fine, smooth network, all depending upon the arrangement of the layer of epithelium situated upon the dentin. Again, when the epithelial layer is not present, owing to an unstable nervous system, the cement may be irregularly laid upon the outer surface of the

at the neck of the tooth, and gradually grows thicker and thicker as the ends of the roots are reached. It is laid down in layers, but not uniformly. Sometimes the thickest part is located upon one side of the end of the root; rarely is it uniformly distributed. The cement substance, as a rule, is unusually thickly

FIG. 3.



(Magn. 8.)

dentin, making spaces filled with protoplasm between them. This space I have called the *inter-dentino-cemental* space.

Just as the cement is deposited and overlaps the enamel at the neck of the tooth, so the cement may be deposited upon the entire outer surface of the epithelial layer which sometimes covers the roots of a tooth. The process of cement development upon the epithelial layer is not unlike the normal deposition upon the dentin of the root. It is very thin

deposited at the bifurcation between the roots.

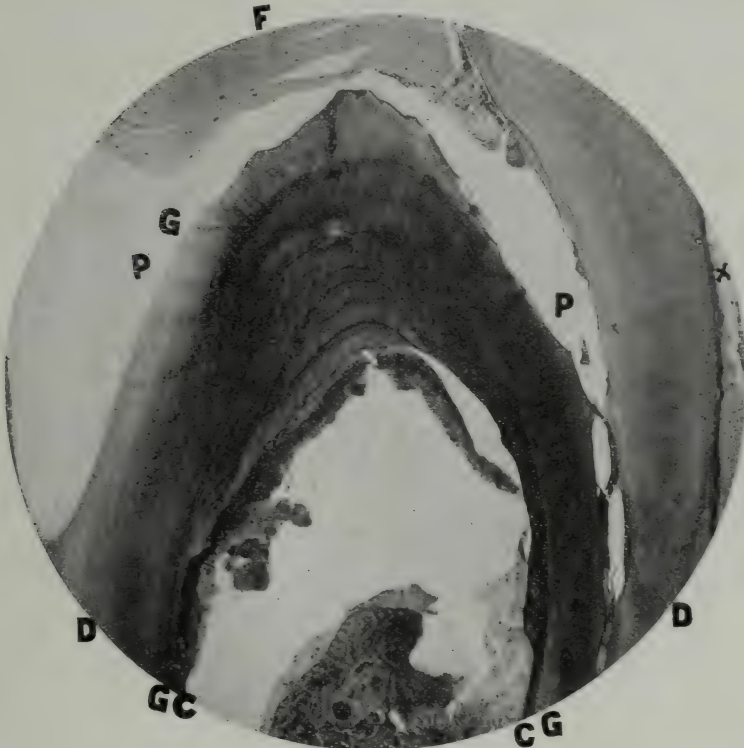
In a large percentage of normally developed human teeth at the present time, the external epithelial structure does not extend below the edge of the enamel at the neck of the tooth. This must be the normal position in the human at his present stage of evolution. In such cases the cement is deposited directly upon the dentin. Under certain conditions, namely, with malnutrition and an un-

stable nervous system, the first layer is unevenly and loosely deposited. Thus cavities or spaces are found filled with protoplasm extending part way or entirely around the dentin from the neck to the end of the root.

If we treat a tooth with five per cent. nitric acid—and in young teeth a much

The fibers of the peridental membrane, not being affected by the acid, hold tenaciously to the cementum. The cementum and the so-called Nasmyth's membrane, becoming softer than the dentin owing to its underdeveloped condition and to the technique in preparation for the microscope, may assume upon the

FIG. 4.



(Magn. 13.)

less percentage—we shall find that when a section is finally cut and placed under the microscope, in many cases the acid has entirely destroyed the protoplasmic layer, including the epithelial structure. The cementum separates itself from the dentin and may be found entirely removed, partially removed, separated in places, or still in position with a white transparent space, and often with a bluish or purplish line of granular epithelial cells due to the stain, situated between the cementum and the dentin.

slide almost any position or form imaginable.

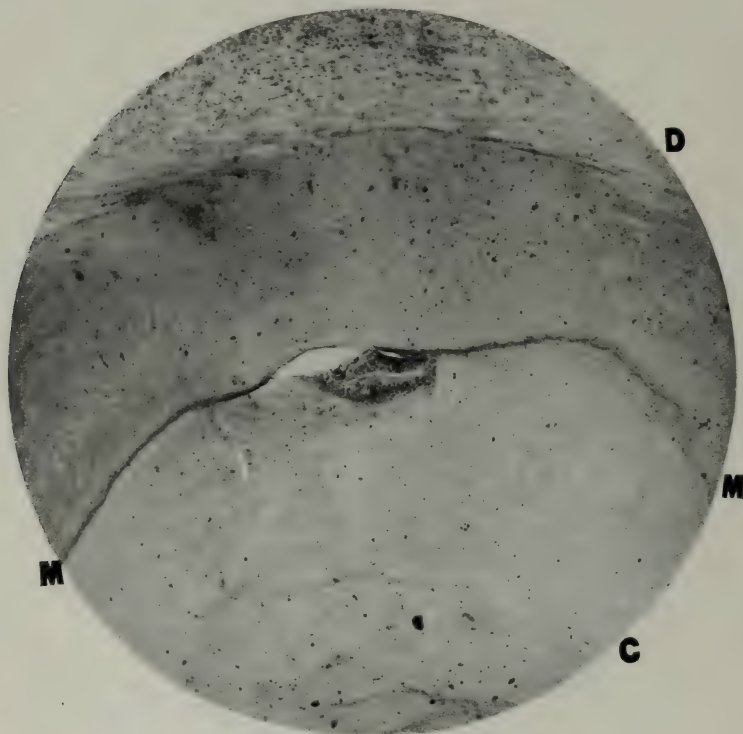
Fig. 1 shows the end of the root of a molar tooth of a dog: *D* is the dentin, *C* the cementum, *B* the peridental membrane, *GL* the inter-dentino-cemental space. A number of arteries are also observed in the center of the picture, one in the space, two in the cementum, and smaller ones located throughout the picture along the line of the dentin in the inter-dentino-cemental space. The external epithelial layer of the enamel

organ extends through this structure between the dentin and the cementum.*

Fig. 2 is a very low magnification of a human cuspid tooth; this low power was necessary to include the entire root of the tooth. The details, therefore, are almost entirely obliterated. With our

A is the alveolar process, c the cementum, and D the dentin. Just above G may be seen a very minute white spot which is an artery located in the inter-dentino-cemental space. The granular space may be traced extending diagonally to the right and upward until a space is seen extending to the neck of the tooth.

FIG. 5.



(Magn. 75.)

knowledge of tooth structure and its surroundings one can easily trace the finer details in connection with this picture:

* In a former paper, "Nasmyth's Membrane, Epithelial Débris, and the Granular Layer of Tomes," read before the American Medical Association, and published in the *Journal* July 13, 1918, I called these malformed structures "the granular layer of Tomes." Since studying Mr. Tomes' interpretation of the subject I am convinced that my views expressed at that time upon this space were wrong.

The dark line at N is the so-called Nasmyth's membrane or the external epithelial layer. It extends from the crown of the tooth across the gingival space and passes down between the cementum and dentin in the granular layer across the root of the tooth to the opposite side through and including the artery, up the outer surface, clinging to the dentin as far as the neck of the tooth.

The cement begins in a very thin layer at N and increases in thickness for about one-half the length of the root. It then

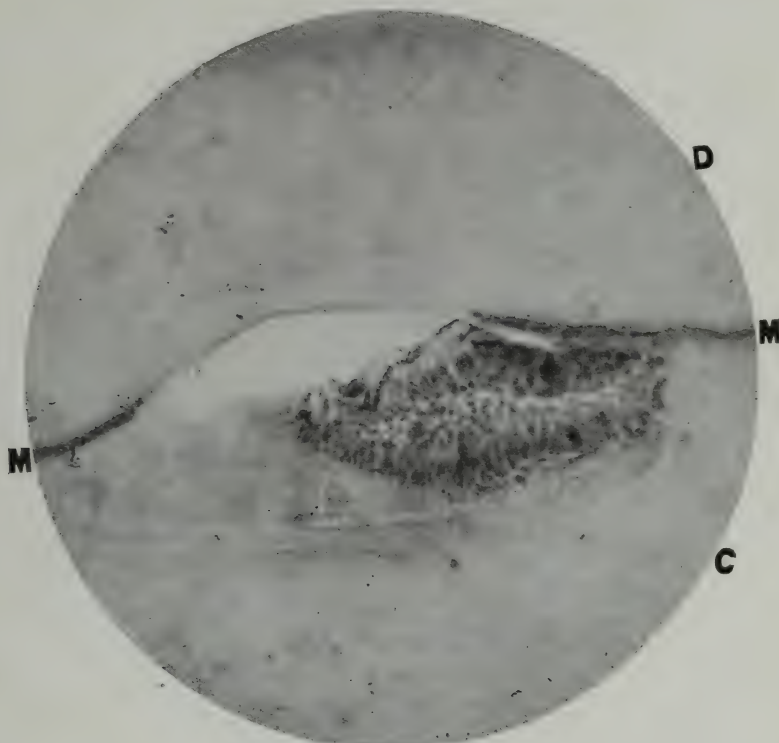
rapidly thickens upon the right side, covering the end of the root. Very little cement is seen upon the left side of the root.

Fig 3 shows another root and alveolar process of a human bicuspid tooth. The magnification is a trifle higher than in Fig. 2. The details, however, are

In this picture the largest amount of cement is located upon the left side of the root.

Fig. 4 is the picture of a human lower second molar tooth: c is the cementum, d the dentin, f the filling material in the pulp chamber, g the granular layer, and r the root-canals in the roots of the

FIG. 6.



(Magn. 275.)

much clearer: A is the alveolar process, c the cementum, d the dentin, and n the so-called Nasmyth's membrane. From either side of the neck of the tooth may be seen the so-called Nasmyth's membrane extending across the gingival space and passing down a short distance until the cementum is reached. Here it passes inside between the dentin and the cementum, and forms the granular space. A dark line in the picture always represents the violet-colored epithelial layer.

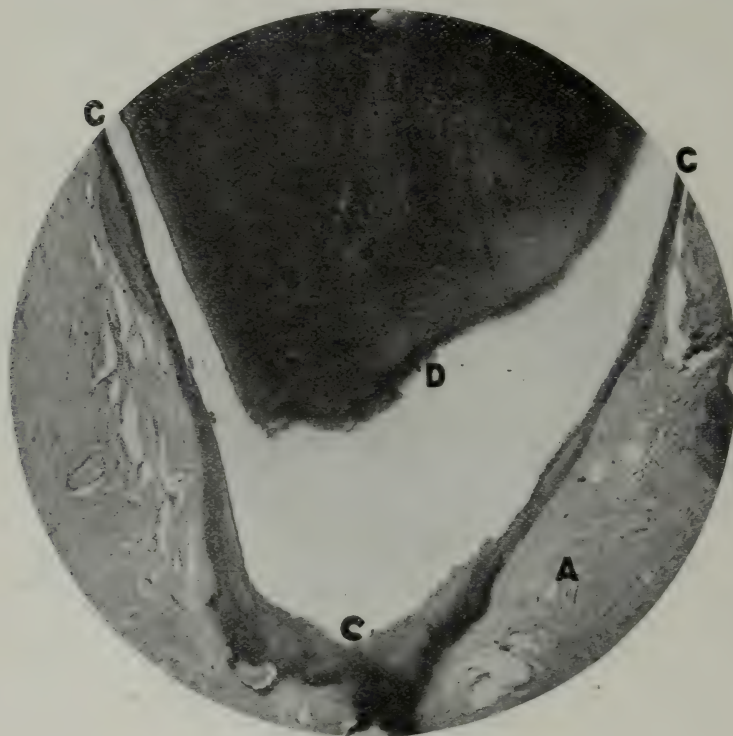
tooth. Between the roots is the gum tissue. By following g, the granular layer, upon either side, the dark line is the epithelial layer between the dentin and the cementum. When it reaches the center of the picture a small white space is observed. Here the epithelial layer has looped upon itself. The cementum is deposited upon the epithelial layer in many thicknesses. This space is midway between the floor of the pulp chamber and the outer surface of the cement

between the roots. One inch below the cross a white space can also be seen with a magnifying glass in the inter-dentino-cemental space.

Fig. 5 shows a higher magnification than the previous picture: *c* is the cementum, *d* the dentin, and *m* the epithelial layer located in the inter-dentino-

lial cells. Note that the cells take the nature of a glandular structure, although located in dense, hard tissue. The epithelial layer is seen at *m* on each side of the picture. These cells show the tendency to develop and the epithelial layer to elongate when nourishment is present.

FIG. 7.



(Magn. 23.)

cemental space. The large space in the center of the picture is the space shown in Fig. 4 at *g*. To the right and below is seen a nest of epithelial cells. These cells could in no other way be developed in the center of hard bony substance located such a distance from the epithelial structure of the tooth than by the way of the external epithelial layer extending throughout the inter-dentino-cemental space.

Fig. 6 shows a still larger magnification of the cavity and the nest of epithe-

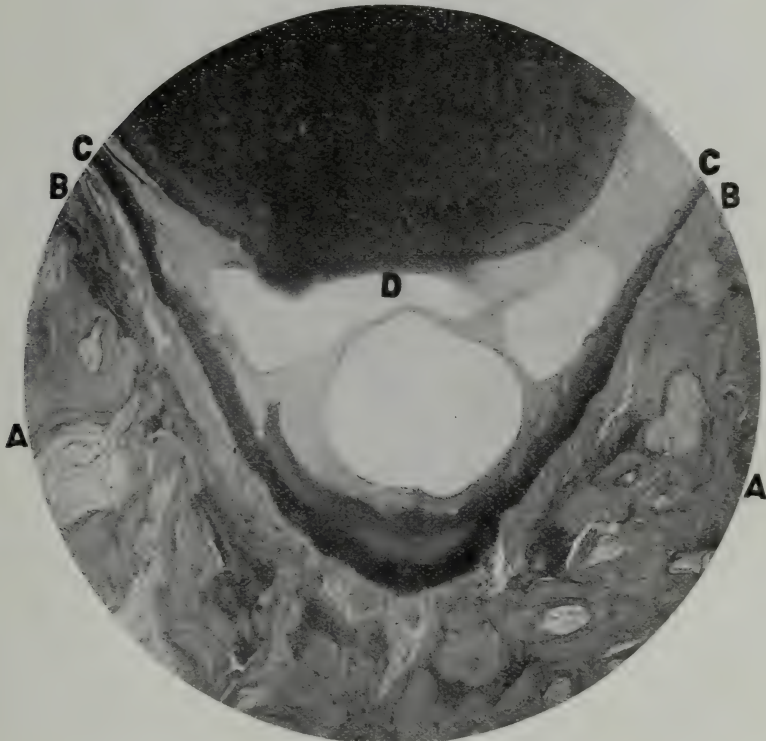
To further show the action of acids upon the inter-dentino-cemental space and the complete destruction which may occur throughout the entire length of the root upon both sides, and also to show the tenacity with which the fibers of the periodontal membrane are attached to the cementum, the following pictures are here introduced:

Fig. 7 is a picture of the end of the root and alveolar process of a human bicuspid: *A* is the alveolar process, *c* the cementum in the epithelial layer, and *d*

the dentin. In the preparation of this specimen for the microscope, the knife was drawn through the alveolar process first. The tooth being harder than the alveolar process, and the inter-dentino-cemental space being entirely destroyed by the acids, the dentin was slightly pulled away from the cementum and the epithelial layers which are held firmly in place

The light space between the cementum and the dentin is filled with celloidin. In drawing the tooth-root away from the cementum, air has entered, which shows in the three large globular spaces. This separation has also occurred throughout the entire length of the root, leaving the cementum and epithelial layer in position in its relation to the alveolar process.

FIG. 8.



(Magn. 23.)

by the fibers of the peridental membrane. The dentin has separated from the cementum throughout its entire length.

Fig. 8: Another picture of another human tooth is here shown. Although of the same magnification, it shows the details to a little better advantage than the previous one: A is the alveolar process, B the peridental membrane, C the cementum and epithelial layer, and D the dentin.

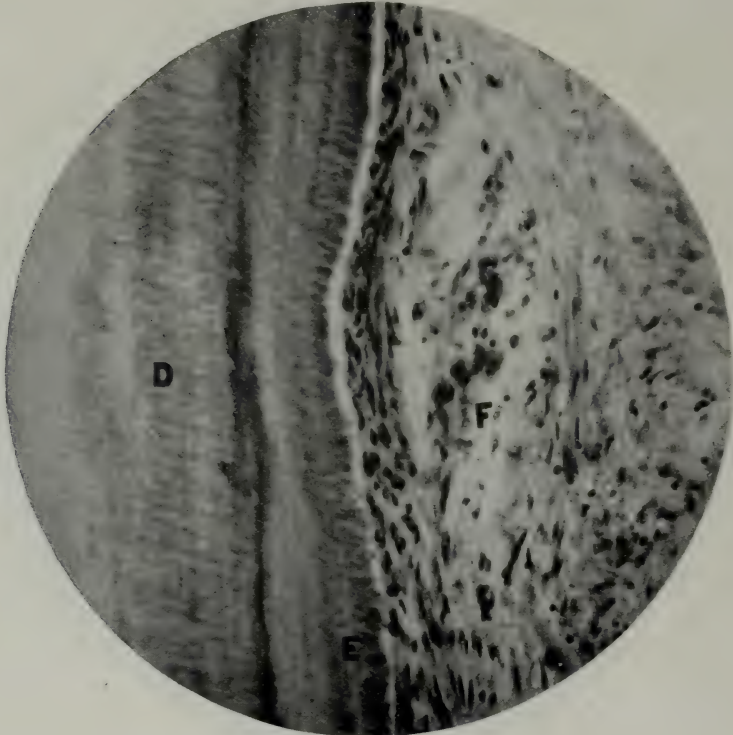
Fig. 9 is a higher magnification taken at the cross midway between the neck and the apex of Fig. 4: D is the dentin, E the epithelial cells, and F the fibrous tissue. It shows the epithelial cells greatly enlarged but degenerated in structure. The cells have lost their nuclei, have shrunk, and granulation has taken place in the body of the cell. When degeneration of the cells of the epithelial layer occurs and the structures

are stained for the microscope, a bluish purple or a purple line is seen. This purple line is frequently seen in sections in the inter-dentino-cemental space, extending from the gum line on one side to the gum line on the other.

Fig. 10 is also of a high magnification taken at the bifurcation of the roots of

is reasonably certain that it is pathologic in the degenerate human teeth. When the pulp is destroyed, whether the root is properly filled or not, there must be decomposition of structure producing discoloration and the formation of gases, and when there is an opening to the surface, as shown in paper No. II, Sep-

FIG. 9.



(Magn. 300.)

a molar of a lamb soon after birth: **D** is the dentin, **E** the epithelial cells, **F** the fibrous tissue of the sac wall, eventually the peridental membrane. The cells are not unlike those of the human. The epithelial layer extends around the dentin of the root as in the human.

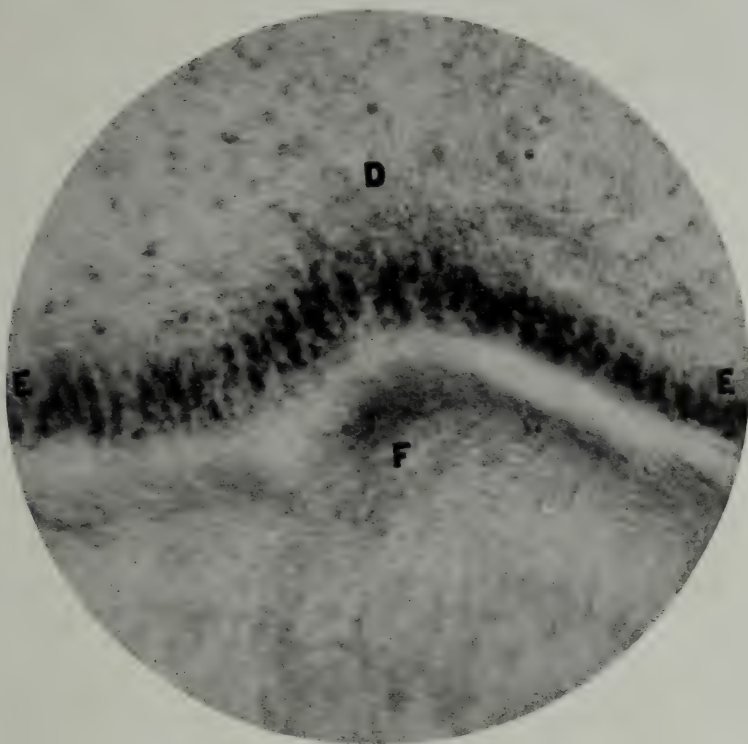
Whether this arrangement of structure is normal in lower vertebrates, especially in the sheep, I am unable to say. It is very commonly seen, however. It

tember DENTAL COSMOS—"Abnormal Collateral Arterial Development in the Roots of Teeth"—infection occurs and peridental abscesses form, as I shall show later.

As we progress with our work we shall see many illustrations where the dentin has separated from the cementum at the inter-dentino-cemental space, due to the use of too strong acid in decalcifying the bone and teeth. (Not over 3 per cent.

nitric acid should be used for this researches: Prof. Ludwig Hektoen, Chicago.) All these degeneracies greatly

FIG. 10.



(Magn. 300.)

assist in preventing the success of root-fillings.

The author is under obligation to the following scientists for confirming his

Pathological Laboratory, Chicago, and Prof. E. R. Le Count, Chicago.

31 N. STATE ST.

(To be continued.)

Business System in Connection with Office Practice.

By R. R. BYRNES, D.D.S., Richmond, Va.

SCHOOL OF DENTISTRY, MEDICAL COLLEGE OF VIRGINIA.

(Read before the annual meeting of the Maryland State Dental Association, Baltimore, June 12, 1919.)

'T IS not the volume of work that we do,
 But the kind that we do that counts;
 And results obtained when the work is through
 Are what figures in final amounts.
 Without some regular system and plan
 Much of our labor is vain;
 A worker may not be a lazy man,
 Yet small his progress and gain.

ASK the average dentist what he made last year, and almost invariably he will answer, "My collections were so-and-so." The difference between the amount mentioned in his answer and the amount in the correct answer represents the difference between *earnings* and *collections*, and often represents the combination of a good dentist and a poor business man, because this difference represents in large proportion the uncollected accounts.

Our first effort, therefore, should be to select, instal, or evolve such a system of accounts as will show accurately our net earnings. The gross earnings must represent the amount charged our patients, it matters not whether they pay cash or are charged on our individual ledger. For this purpose a day-book must be kept. "Day-book" here is used in the sense of the accepted term; it may actually be a book, loose leaves, or cards, but it should show, among other things, the time employed. The element of time is a fundamental for a proper charge for your product; to this, of course, must be added the charge for

your material. Still another consideration is "bad accounts." Record of time spent on a case in your laboratory should be as accurately kept as time spent at the chair, if you would know whether results are a profit or a loss.

Every young dentist starting out is confronted with the problem, What shall I charge for this or for that operation? He usually winds up by charging as nearly as possible what dentists in the class to which he aspires are charging for the same, and permitting this to govern. Rarely does he compare his equipment, investment, and operating expenses (overhead and other) with that of the men whose prices he would imitate. Nor does he consider relative speed in accomplishing the same standard of work. If so, he would discover some of the fundamentals of any business.

For example, the man with an expensive equipment, who has practiced long enough to acquire speed, can thereby overcome this handicap in a novice with similar equipment. In other words, he can afford to charge less and still will

show equal gross earnings. To overcome this handicap the young tyro with expensive equipment must work longer hours—which, having youth, he is usually able to do. The older dentist has earned his “place in the sun,” literally and figuratively. What if he refuses to remain a daylight worker and still works into the night? The new man must then make allowances for that. I am tempted to say, Show me a man’s equipment, give me a detail of his overhead expenses, together with an idea of his standard of living, and I’ll tell you what he must earn to “get by,” as we sometimes say.

DETERMINING ONE’S TOTAL YEARLY EXPENSES.

In starting any business, a survey of the reasonable expenses must be made and the prospect of possible earnings determined. For this purpose I have prepared Chart No. I. (See page 1081.)

CHART NO. I.

Earnings and expenses.

1. Interest on investment, say at 6 per cent. \$..

is the first item to consider. For this an accurate account must be kept of equipment purchased, in order that your charge for interest may be increased from time to time. It is not amiss, if desired, to add to this the cost of your dental education. The interest is figured for the year, and one-twelfth, or $\frac{1}{12}$ of 1 per cent., charged in each month.

2. Taxes and licenses \$..

should include federal, state, county, and city taxes; also, all licenses. For purposes of making tax returns you may prefer to keep these in more detail. One-twelfth of the approximate total of taxes and licenses paid the preceding year should be charged each month. When the current taxes are paid, an adjustment is made in that month, and the accumulated over- or undercharge is distributed equally for the remaining months of the year. For example, say

the taxes last year were \$240.00. Starting in January of this year we charge each month \$20.00. If taxes are paid in September and are \$252.00, we shall have already charged in this year, through August, \$160.00. This leaves a balance of \$92.00 to be distributed equally over the four remaining months, September, October, November and December, or \$23.00 each month.

3. Insurance \$..

This is handled in precisely the same manner as taxes, except that it is more easily determined and less likely to need adjustment.

4. Depreciation \$..

This should be determined by dividing the cost by the probable life of the equipment. It sometimes requires great moral courage to properly load this account.

5. Rent, light, and power \$..

Under this head will be included heat and water if in an office building; if not, then they should be shown under this heading together with light and power.

6. Office operating expenses \$..

This should include salaries of assistants, secretaries and maids, laundry, telephones, stationery, printing and engraving, postage, express, books, magazines, dental society expense, etc.

7. Miscellaneous \$..

for unclassified items.

8. Personal allowance for your services [or, if you wish, salary]... \$..

This is a most important consideration, and offers a splendid opportunity for a man to place a value on his ability. On the other hand it may represent what a man can afford himself for living expenses. In either event it contains great possibilities for shock to our complacency.

9. Materials and supplies (dental).. \$..

Under this will be included precious metals, other supplies, and laboratory bills for work sent out. It should be insisted that bills accompany all purchases, including laboratory accounts. The bills should be entered in the expense book immediately upon verification.

10. Total expenses..... \$..

(Merely the total of foregoing items.)

On the other side of the account we have our

11. Earnings \$..

These must yield enough to at least cover all the preceding items of expense.

In the survey before you, no attempt is made to arrange the items according to accepted accounting form, but rather to conform to an agreement most logical to obtain the desired result, namely, a method by which any dentist with a little application may analyze his business.

No elaborate set of books is necessary to keep such an analysis by months, if one is willing to do two things:

First: Take an inventory of the items which he buys in bulk. The small quantities may be charged direct to month or months in which used. If this seems prodigious, at least results should be known accurately once a year on something better than a neighborhood-grocery-store basis.

Second: Devote sufficient time each month to writing up the previous month's business.

MONTHLY OR ANNUAL INVENTORY.

For carrying out this important purpose, either monthly or annually, the form Chart No. II (see page 1081) should be used.

CHART NO. II.

Inventory.

	Quant'y.	Value.
1. On hand beginning of period [month or year]		\$..
2. Add: Purchased during period		\$..
3. Total		\$..

4. Deduct: On hand close of period	\$..
5. Result: Used during period ..	\$..
6. Value (item 5 multiplied by cost)	\$..

For either a monthly or yearly inventory a multi-columned book may be used. These may be obtained providing almost any reasonable number of columns. A column may be used for each item of materials and supplies. The form above (Chart No. II) is written but once, at each inventory period, in the wide descriptive column to the left.

DISTRIBUTION OF EXPENSES.

A better plan, however, is outlined in Chart No. III (see opposite page), providing for a *distribution* of all expenses. In this chart we combine the inventoried and un-inventoried materials and supplies, together with all other expenses—giving us at the close of the month, by a very simple plan, a bird's-eye view of our expenses.

Each column is headed with the name of the material, supply, or expense, together with its corresponding item number as condensed in *Earnings and expenses*, Chart No. I.

The first item of *Expense distribution*, Chart No. III, reads: "On hand beginning of period." Manifestly this line is used only in the columns for materials and supplies for which inventory is taken—that is, those which are bought in sufficient quantities to warrant an inventory. In other columns a dash may be placed on this line to preclude its use—for instance, for small supplies like nitrate of silver, etc. A dash is also placed on the first line of columns headed "Office operating expenses," "Rent," etc. It is recommended that all inventoried items be placed farthest to the left in order that they may be nearest the descriptive column at the left of the page. "Purchased during period" applies to all columns on the page. The remainder of the inventory form is detailed at the bottom of the

page in the descriptive column, *i.e.* "3. Total"; "4. On hand close of period"; "5. Used during period." Guide lines are ruled from these items as far across the page as the inventoried supplies extend. It is plain that this form is needed only for inventoried items. The totals for the other items, "Office operating expenses," "Small supplies," etc., are placed on the last line, opposite item 6, or "Value." All figures on this line are re-capped by item numbers in Chart No. I. This chart (No. I) may be spread on another page of the same multi-columned book.

The number of columns used in *Expense distribution*, Chart No. III, will depend upon the degree of segregation desired in keeping the accounts. For instance, we may desire one column for precious metals, or may wish the metals segregated to show various divisions of our work as operative, prosthetic, and crown and bridge metals, in order that we may know which yields greatest returns, or we may further divide to show various kinds of metal, as plate, solder, nuggets, foil, etc. This is not likely, but is mentioned to show the possibilities in the use of such a form. All, however, would, together with other supplies, wind up in the item "9. Materials and supplies," of our *Earnings and expenses*, Chart No. I.

Again, we may wish our office expenses in greater detail, desiring to know laundry, salaries, etc. Each detail column must retain its item number in order that all may be added together and entered as one amount in *Earnings and expenses*, opposite the title "6. Office operating expenses."

Should the two pages as the book lies open not provide enough columns, they may be readily increased by determining the number needed, then cutting a sufficient number of additional pages so as to eliminate the wide descriptive column at the left, on all but the commencing page for each month. The tops are also cut to expose to view the column heads on commencing page.

The book used for *Earnings and expenses* (Chart No. I) should provide

twenty-four columns, thereby allowing a debit and credit column for each of the twelve months of the year. In this way we have the year's business before us, by months, for comparative survey.

We may or may not wish to detail items 1, 2, 3, and 4 on the *Expense distribution* form (Chart No. III). It is advisable, but not absolutely necessary, as these are more or less fixed charges, and, as stated, should be pro-rated on a monthly basis. However, whatever accounts are kept in the *Expense distribution* must finally be shown in the *Earnings and expenses* form, opposite the proper titles, in the debit, or left-hand column. The total of expenses, or item 10, is also to be shown on the left.

It may readily be seen that Chart No. I is also elastic, and may reflect greater detail if desired. For example, we may wish to know each month from this recapitulation what our laundry is costing. If so, it is necessary only to add a column for that purpose in our *Expense distribution* sheet, giving it another item number, and bring the total forward each month to a similarly named and numbered item on our *Earnings and expenses* form (Chart No. I). We may wish to divide item 9, "Materials and supplies" into "Precious metals," "Other supplies," and (outside) "Laboratory bills." This is accomplished in the same way, *i.e.* provide a column for each in *Expense distribution*, and a corresponding line on the *Earnings and expenses* form (Chart No. I).

The rule then for the secretary would be, "Item numbers in *Expense distribution* change only when the *Earnings and expenses* form is changed."

Assuming that there are but two sources of cash payments, *i.e.* petty cash and checks, care must be exercised in posting to *Expense distribution* not to post payment of bills which were entered thereon when the goods were received. Salaries, personal allowance, rent, and as many items as practicable, should be paid by check to provide the best form of receipt, and should be posted direct to *Expense distribution* book from the check stub.

To consider, now, the practical value of the information on Chart No. I, or our monthly recapitulation: Our "Total expenses," item 10, shows on a true, not a cash-book basis, what it was necessary to have *earned* (not just collected) to have paid our way—to have kept even with the game. The question is, Did you?

Again, a division of "Total expenses" by the hours worked during the month will show the minimum average we could afford to receive for our average hour's work, plus material, and be assured that we can keep up with the bills of the landlord, butcher, baker, and grocer, not to mention bills for a host of other necessities, and maybe luxuries. Did you receive it?

An analysis of this indicates our moral right to the pace we are going. Whether we may ride in a Packard or a "flivver," or just walk; whether we may take our lunches at the Club or at Quick & Dirty's; whether we may play golf or ping-pong; whether we may smoke panetelas or coffin-tacks, or even smoke at all; whether we may donate fifty cents, fifty dollars, or five hundred dollars to the church building fund—and if we do any or all of these things, whether we should charge them to personal expenses, to advertisement, or to camouflage!

A religious adherence to a monthly study of our recapitulation of expenses enables us to keep our finger on the pulse of our business. All manner of percentages and statistics may be worked out, depending upon one's genius and taste for figures.

DETERMINING THE NUMBER OF EARNING HOURS AVAILABLE.

Do not fall into the error of considering all hours spent in the office as earning hours.

From the office hours per year should be deducted time off for vacation, conventions and meetings, lunch time, discussions, charity work, time *lost* in changing patients, time spent at the telephone on private business, etc., also time *required* by patients in dismissing them

should be charged to their account. A strict record of these will, in all probability, show on the average that only about fifty per cent. of the office hours are actually earning hours. If the total hours include night or Sunday work in the laboratory, the percentage of income hours will be greater, because of fewer interruptions. A continuance of night and Sunday work, however, will eventually reduce the income hours by impairing efficiency, or even *possibly* by forcing us to indulge in a prolonged vacation for six months, twice a year, commencing with a well-attended, though rather joyless ride in a hearse!

Of course, the earning hours are the ones to be used as the basis of calculations. They are the ones to divide into the overhead expenses to see how much we must charge for our time. In addition to this the charge for the material must pay for its cost and handling. Bear in mind this is merely to protect us from losing money. How much more than this we can *afford* to charge is dependent upon our work, our *clientèle*, and very often, our nerve!

Upon the fundamentals embodied in the *Earnings and expenses* statement, hinges success or failure. Why not, then, have a knowledge of them as they occur, and not wait for bankruptcy or nervous prostration to force us to a realization that we should follow the plow and not the plugger; that we made a mistake in the choice of our engine, confounding the dental with the steam or some other variety!

I have looked over a number of accounting systems for dentists. Most of them provide a fairly good means of keeping up with the income or earnings, so that a total of the charges made to the patient's account (not the amount of cash collected) during the month represents, with a fair degree of accuracy, the earnings. Of course, any cash collected for an operation for which no charge account or card has been made should be added to the total earnings. As a matter of record, though, a card should always be made out and charges and credits regularly entered thereon.

The resulting total should be entered as item "11. Earnings," in the right-hand or credit column of the *Earnings and expenses* form (Chart No. 1.)

I find most card systems provide a space for hours devoted to work, but I am convinced that dentists are not as careful about recording the laboratory hours as they should be. For this purpose your essayist would strongly recommend a time stamp as used in commercial houses. I am confident it will yield big returns on the investment. The time spent at the chair is usually more accurately kept because we can delegate this task to our secretaries. A time stamp for this work is within the realms of practicability, though it is subject to many objections. In lieu of this a small clock or cheap watch may, with a little ingenuity, be arranged to record the time of starting and completing operations.

It is to be hoped that item 12 will always show a balance in favor of earnings. If not, you have two "specifics"—increase your earnings or decrease your expenses! Simplicity itself, isn't it? No "radiogram" nor "paint with iodine"

here! Of course, I can anticipate the one who would say, "Why not do both?"

Your essayist has purposely avoided a presentation of the physical side of the question, believing that each individual will solve that if once convinced of the value of the accounting side. It would be insulting your intelligence to believe that you will continue to waste time and energy doing a marathon around that office partition, when shown, in hours and minutes saved, with what toboggan-like expediency the distance may be negotiated by simply cutting a door. Nor will it be necessary to direct your attention to time saved in having pairs of certain instruments made in double ends. Figures will stimulate you to make an economic diagnosis and apply these specifics to your office ailments.

If, in my feeble way, I have succeeded in interesting without frightening you, I shall feel that my time has been well employed. I thank you.

12TH AND CLAY STS.

[See also *Discussion*, as reported under "Proceedings of Societies," December issue.]

The Importance of the Dental Assistant, and a Method of Training Her.

By A. L. MIDGLEY, D.M.D., Providence, R. I.

(Read before the annual meeting of the Pennsylvania State Dental Society, Pittsburgh, April 29, 1919.)

THE brilliant studies in and contributions to pathology and the ingenious skilled methods developed for the scientific and artistic restoration of lost tooth substance impress the student of today with the fact that dental operations, properly and thoroughly performed, require time. The very vital and true significance of disease conditions in and about the tissues of the mouth, face, and jaws, and the influence of these conditions upon the general health of the patient, are constantly and in no uncertain terms being impressed very firmly upon the observing minds of the dental profession.

As a result of the findings of these scientific investigations and of the improved technique in our operative work for the correction of these disease conditions, the moral responsibility of the dentist in treating his patient is becoming greater and stronger. With the growing demands and exactions of detail in these operations there is a resulting and an ever-increasing demand on the mental and physical state of the dental operator, not only because of time required, but also because of the concentrated, sustained application that modern methods require. Because of these great inroads of time on his working hours and of the drain on his physical and mental resources that this exacting technique entails, there is, in many cases, a consequent lack of recreation for the dentist. If he is to be fit to work and keep pace with these rapid advances and have time for rest and play, he must have his business or-

ganization so well constructed that those matters which he need not necessarily attend to himself, but which are essentially vital to every operation, may be taken care of by someone trained in such a manner that none of those finer details and absolute requisites of technique are lost—for this means just the difference between the work of the artist and the average operator.

Hence it logically follows, while we are so zealously engaged in our studies of pathology and of scientific and artistic restoration of lost tooth substance, that it is good practice and sound judgment for us to direct our attention toward means that may be applied by the operator to give better service to his patient with less strain on his mental and physical capacity, and to supervise, with a minimum of effort and attention, intelligently trained and well-directed assistance, and in this manner to accomplish more in less time and with better results than is possible under older methods of operating.

Present-day dental medicine and surgery and the lessons we are learning therefrom teach us, more forcefully than ever before, the very great value and absolute necessity of true skill.

With respect to the dental surgeon, skill means, among other things, practical facility in doing his work, and hence it implies the rapid and harmonious working of mind with hand. Now, it is of course of elementary psychology that the efficient co-ordination of activities demands the concentration of attention

—which must suffer no distraction nor interruption by irrelevant things if any high degree of skill is to be developed and constantly maintained. It is here, precisely, that the trained assistant serves a most essential purpose, for it is she who aids very materially in making the highest grades of skill at all possible.

The prime requisite of true skill in dentistry is cleanliness, and without it the former is never acquired. This cardinal virtue, cleanliness, is the first and last word in dental surgery, and order, one of the chief characteristics of it, depends for its development upon the rigidity or degree with which cleanliness is practiced. Both are indispensable where continued, intensive application, with the resulting happy harmony between mind and hand, has so much to do with the success or failure of an operation.

From the combination of cleanliness and order with profound study, and a correct interpretation of the principles taught by study, true skill is born, and with it what it signifies, viz, speed, precision, safety, thoroughness, accuracy, sureness—all of which foster deftness, gentleness and delicacy of touch, vigorously supported by sustained and concentrated application. With true skill lost motion vanishes, time is saved, silence replaces noise, and confusion with attending annoyances disappears. As skill becomes more and more pronounced and brilliant with the appearance of these qualities and the resulting elimination of these hindrances, the confidence of the patient in the operator grows stronger and the physical and mental poise of the operator becomes fixed, and as a result we have the ideal product of finished skill, namely, quality happily and scientifically blended with quantity.

The discriminating and well-informed patient today recognizes the importance not only of practical cleanliness, but also of surgical cleanliness, for he has a useful knowledge of parasitic organisms and their activities. Many are so discriminating as to observe very closely, and after their observations to conclude quite rightly that it is not good surgery for

an operator to place his fingers in a patient's mouth, then sort over instruments in a cabinet in looking for one that might be necessary for the satisfactory completion of some operation, and then to place that instrument or his fingers in the patient's mouth without following rules of cleanliness and asepsis.

We are no more justified in pursuing such a lax technique than would be a surgeon in following a like practice in an abdominal operation. If the present-day operator fails to obey these laws of cleanliness and asepsis the patient loses that sense of security and safety from infection which he has learned to look for and to which he is entitled.

We realize that it is one thing to talk surgical cleanliness and another thing to practice it, because it is often very difficult and sometimes impossible to apply the principles of surgical asepsis in a practical manner; but we should always remember that it is never impossible for us to follow a rigid practical cleanliness. If we bear this in mind, and bend our efforts toward equaling the aseptic technique of the abdominal surgeon, we shall at least closely approximate it in nearly every case, and in those where we do not we shall materially lessen the hazard of infection. We must be very painstaking in these matters if we do not wish to assume the responsibility of placing any germs in a patient's mouth needlessly. In other words, we should not follow the sophistry that because the mouth abounds with countless bacteria the addition of those that may be on our hands or instruments will do the patient no harm. We shall try to show you with lantern slides how the properly instructed dental assistant minimizes greatly the hazard of this possibility, for as a result of our proper training of her she has a practical knowledge of disease-producing organisms, their activities, and the methods of destroying them.

We shall attempt to show also that she does exclude, and very, very materially so, the bothers and worries incident to frequent interruptions to the busy and conscientious operator, which of course

are a hindrance to intensive, sustained effort and application, and, as we have said, these have their influence upon one's skill, and must be removed if a man is to put his whole heart and soul into his work. It is absurd and unsound business reasoning and only low average operative technique for the dentist, highly trained as he is, to waste his time sorting or sharpening instruments, mixing cements and amalgams, preparing novocain solutions, etc., when these things can be done by one who may not possess his degree of skill yet who has the qualifications developed to such a degree that the technique followed by her shall not be a libel against dental science.

One may say that this reasoning is logical and that the essayist is quite right, but that in a day's work what she does amounts to so little that it is not of much importance.

In answer we would say that it may seem trifling, but we must remember that the dental assistant we are describing, when properly trained and educated, is spending the same amount of time in the office as the dentist and doing work all the time that the operator himself must of necessity perform if she were not there.

The dental assistant we are presenting not only assists us in operative technique, but also superintends and directs the work of the secretary and the sterilizing assistant, and thus eliminates from the operator's attention those necessities so essential to the smooth, harmonious running of the office, which requisites in themselves are remotely essential to the operation at hand. With lantern slides to assist us, we shall try to explain an arrangement whereby the intensive, sustained application to a given piece of work is never interfered with in any way by matters that have no direct bearing on the case under consideration, yet at the same time the operator has at all times his "finger on the pulse" on all that is going on in the entire office, with a minimizing of time, effort, and physical and mental expense.

The basic features of the plan pre-

sented are embodied in the use of a system of silent signaling, worked with numbers and colors, and at all times due attention is paid to order and movement. There is a book of reference for the assistant with an outline of the steps of every operation performed in the office, with instruments and steps in technique all numbered and placed on charts in the numerical order of sequence of their use.

The entire plan is the result of study in this direction for a number of years, and of course it is constantly being changed and improved upon to meet new conditions as they arise. We do not by any means present it as the last word, but do feel that it is a step in the right direction to meet the present-day requirements of dentistry. It may have its weaknesses, and I hope in the discussion that follows you may point them out to me. It is not filled with red tape, a condition too commonly met with when system is followed with practical needs heavily drawn upon. It is a time-saver, a supporter of close application, and a practice-builder. It makes for speed, precision, safety, thoroughness, accuracy, sureness, deftness, gentleness, delicacy of touch, always supported with sustained and concentrated application. It does eliminate to a very practical degree lost motion, noise, and confusion, with attendant annoyances and hindrances, and it produces quality happily blended with quantity, thus making the practice of dentistry a joy and not a drudgery. We may say, without fear of contradiction by those who do not practice this method or one similar to it, that what we ordinarily do in seven hours can be done more easily and with better results in from four and one half to five hours. We may sum it all up by saying that if this system, or one similar, is supported with an adequate equipment and the details of it studiously followed, the gratifying results to both patient and operator are immeasurable.

315 BUTLER EXCHANGE.

[See also *Discussion*, as reported under "Proceedings of Societies," this issue.]

A Question of Inter-Professional Ethics.

By O. L. HERTIG, A.M., D.D.S., Pittsburgh, Pa.

(Read before the annual meeting of the Pennsylvania State Dental Society, Pittsburgh, April 29, 1919.)

WHEN I commenced writing this paper I expected to make it a polite, smoothly worded protest against certain things concerning our profession—a gentle complaint full of cautious circumlocutions, carefully avoiding offense. I find it cannot be done. Unpleasant facts are best expressed by blunt words, and I may as well be plain.

Many medical men are making dental diagnoses accompanied by specific directions to the dentist as to treatment. Such men in their arrogance are not only meddlers, but are in a sense guilty of malpractice, inasmuch as they assume to take part in the treatment of conditions about which they know nothing. If there is a dentist here who has not felt the meddling medical hand in his dental affairs, I should like him to stand up. Curiosities are always of interest.

It would not be so bad if these physicians had ever made a studious, honest effort to learn something of dentistry from those who know and teach the subject, but the truth is they think the matter beneath them and make no effort to lessen their ignorance.

Among my many medical acquaintances I know very few who can give, offhand, the table of dentition. The sum of their dental knowledge is the ability to make doubtful differentiation between a molar and an incisor, when placed before them. And yet seventy-five per cent. of our physicians assume to pass, with finality, verdicts upon subjects vitally concerning the dentist and dentistry.

The strange part of this medical meddling is that the offender does not think

he is violating any principle of ethics. "Why, I was perfectly polite," he will say; "I simply made the diagnosis, called up Dr. Smith and told him what to do. I think I was doing a nice thing by sending the patient back to him; I might have sent her some place else." *And there you are!*

What are you going to do with a set of men who are unable to appreciate one of the finer points of justice and square dealing?

Now, I want it understood that I am not referring to any particular individual; these things happen so often that the identity of the individual malefactor is lost. I am referring to a predominating element of the medical profession.

My criticism does not extend to any of those front-rank physicians whose attitude toward dentistry is broad and appreciative, those rare men who are willing to help and be helped. They are few, but they are precious, and to them we look for assistance in correcting this most exasperating condition.

Members of the dental profession have never made any particular stand for medical recognition, for they knew it was bound to come. They have never regarded seriously the *admission* that dentistry is a branch of medicine, for they know that such is *not* the case. They do know, however, that the vast science of therapeutics has many branches; medicine is just one, dentistry another. Each has its rights which should be respected.

Do you think, for a minute, that a physician would allow a dentist to meddle with his patients in the matter of

diagnosis and treatment? Could you, in your wildest flights of fancy, imagine such a thing? Yet this same physician, in the immensity of his conceit, thinks it quite within his province to embarrass the dental operator with his often layman-like suggestions and orders.

When Hunter, a prominent English physician, several years ago, brought to the notice of the medical world the significance of oral sepsis, and the evil effects of mouth filth upon the general system, he did the thing that prominent dentists in America had been trying in vain to do for years. He caused the physician to "sit up and take notice," and made him recognize mouth conditions as important factors in health and disease.

Medical journals were full of quotations from Dr. Hunter; they were also full of criticisms of dentistry. They did not differentiate good dentistry from bad—nor, in truth, did Dr. Hunter.

Dentistry has recovered from the shock, assisted by the fact that many of the horrible examples examined by Dr. Hunter had never been in a dental chair.

The X-ray has established a definite relationship between the physician and the dentist in matters of diagnosis. The radiographer himself, if possessed of adequate dental qualifications, may be included in this relationship; but the X-ray artists without these qualifications must be content to allow their pictures to speak for themselves. They have not always done this, for many cases of their meddling are on record. Many X-ray laboratories let out the hint that a request for diagnosis will be granted.

Since it has been definitely established that apical infections are associated with systemic disease, and that a diseased tooth root may prove a focus for grave disorders far distant from it, medical men have been rushing to the front in great disorder in their haste to recognize and take advantage of this great discovery. The fact that it is a dental discovery is significant. This haste, this disorder, and this lack of accurate analysis are characteristic of the physician and dentist alike. In such a hurry are they to

try out new things that years must elapse before accurate estimate can be made in assorting the good from the evil of their indiscriminate experimentation.

Focal infection is a grim reality; but the fact that physicians, in their effort to cover up their own diagnostic deficiencies, aided and abetted by weak-kneed exodontists, are daily sacrificing thousands of good teeth, is grimmer yet! From the present trend of affairs one would think that extraction of the teeth would cure anything from housemaid's knee to the high cost of living. A dozen stories come to you every week of these senseless wholesale extractions. Occasionally a tale will be told about how Mr. So-and-so was cured by the process. The cures at present are in the minority.

No wonder the prosthodontist greets you with a smile. He says of the medical man, "Behold my benefactor! Why should I worry because he steps out of his proper place and interferes with the dentist?"

No doubt my medical friends will criticize me severely for my crudeness in stating this case. I regret this. Unpleasant facts do not harmonize with ornamental verbiage.

I wish to cite a few cases of what I term medical meddling. These cases are typical, and no doubt will seem familiar to very, very many of you.

CASES.

Case I. A man sixty-six years of age, who had been active and efficient until a breakdown some few months before. A big eater, a hard worker, he had used lavishly the resources granted him by nature. Not satisfied with his slow recovery, he had his teeth radiographed. The radiographer, also a physician, made most excellent pictures. The only thing that showed up in the pictures was one pulpless molar, with *no* apical involvement, and a slight blunting of the alveolar crests normal in a person of sixty-six years.

Ocular examination showed the necessity for some little treatment of a prophylactic nature. That was all, yet the

diagnosis in this man's case was osteomyelitis; the treatment ordered was extirpation of the entire masticatory apparatus.

Now, the men who perpetrated that offense are prominent. The patient himself is a physician, showing that that form of ignorance plays no favorites; and he has regained his health without losing his teeth. How he did it is not within the province of this paper to explain.

Case II. This patient, having had some dental trouble, had a series of pictures made of his teeth by a medical X-ray artist. Specific directions were given as to the extraction of an upper second molar and thorough scraping of the socket.

Investigation showed this tooth to be vital and free from decay. The trouble was easily located in a third molar not shown on the picture.

Case III. This man had a tooth extracted. The socket became slightly sore. Being of an apprehensive nature, he feared that it would not heal. His doctor cauterized the wound with nitrate of silver and packed it with gauze. Later, when the opening was big enough to stick the thumb in, the patient wisely removed the dressing. Of course, the wound by this time was very sore and looked very nasty; so after several days this doctor made a vaccine out of the contents of that socket—made a vaccine out of decomposed food particles, mucus, saliva, and other accumulated miscellany, and injected it into the poor man's arm.

So our apprehensive friend got from his trusted physician a sore arm, a sore jaw, and a bill for \$110, all in one dose. Later on, he was sore all over.

A wound that would have healed in two weeks, if left alone, was transformed into a serious lesion requiring three months to heal.

Case IV. This lady came from a nearby town, and brought a note from her physician, reading about as follows:

Dear Doctor,—Miss X is suffering from pyorrhea, and I suspect focal infection as the cause of her poor health. Treat her

gums, and extract the right upper first molar, the left upper second bicuspid, and the left lower second molar.

Respectfully,

Dr. ———.

This lady, whom I had known for years, had absolutely no pathological condition in her mouth. A slight recession of the gums was the only departure from normality; too vigorous use of the toothbrush had caused this. The teeth in question, somewhat discolored by large alloy fillings, were found vital.

Now, this is the way that note should have read, had the writer had the first instinct of courtesy:

Dear Doctor,—Miss X is suffering from some obscure trouble which I have not been able to relieve. If you will kindly give her a thorough dental examination and report your findings to me, I shall esteem it a favor.

Respectfully,

Dr. ———.

How much more decent it would have been, had the note been so worded!

Case V. This patient was having some trouble in erupting a lower third molar, and his physician happened to find this out.

Now, instead of having the sufferer consult his own dentist, a diagnosis of grave import was made. A so-called exodontist, backed up by the exaggerated terms of the diagnosis, was able to rob this young man of a hundred dollars and several days' time in the hospital.

Many pseudo-dental specialists, smart enough and unscrupulous enough to make capital out of the medical man, by catering to his bump of self-importance, easily make him an accessory in exaggerating symptoms and in robbing the frightened patient.

Case VI illustrates this. A case of gingivitis caused by deposits of subgingival calculus, and easily cured by a few simple scaling operations, was labeled pyorrhea by the patient's family physician. Notwithstanding the fact that an appointment had already been made with his dentist, the patient was scared into visiting a periodontist.

Now, did this specialist have the honest courage to correct this mistake? No, not he! Why, if Dr. So-and-so calls it pyorrhea, far be it from him to call it anything else!

No; this confiding young man paid \$250 for a service that could have been well done in four sittings of thirty minutes each, and Mr. Periodontist is regarded as a veritable wizard by his flattered medical adviser.

These cases may be infinitely multiplied, for one large community is very much like another. Conditions that obtain here may be duplicated in a thousand other centers of population. The human-nature factor is ever the same.

For centuries, suffering people have been looking up to the physician with worshiping eyes, regarding him as a superior being; and is it any wonder that, with such an inheritance of unanalytical adulation, the medical man of the present day has an inflated idea of his mental status?

The origin of medicine dates from the sound of the first tom-tom thumped by the "medicine man" of savage people—dates from the first smell of mysterious, malodorous mixtures, boiling in the pots of the wizards of old.

Running true to form up through the countless years, in spite of the refinement of civilization and the softening influences of development and education, in spite of all the broadening effects of its own never-ceasing efforts toward improvement, medicine today is so tinged with the mystery, narrowness, and intolerance of ancient times that its students and devotees are unconsciously affected.

Medical men are loyal to each other,

and savagely fight any apparent trespass upon their domain; but some day they will realize that medicine is but one branch of therapeutics, and that there are many other branches working toward the same end—the good of ailing mankind.

Focal infection arising from diseased tooth roots is one of the most important factors in present-day pathology. The dentist is at one end of the proposition, the physician at the other, with the radiographer occupying a very important position in between.

The need of *harmonious* co-operation is urgent. The dentist must "sit up and take notice." He must drop his ignorant attitude of obstruction and prepare himself, theoretically and technically, to do his part of the task. The physician must get off his "high horse" and meet his co-workers on the common ground of equality; for he has fully as much to learn as the dentist before he can do his share of the diagnostic task. A council of three it should be—the dental operator, the radiographer, and the physician.

All hopelessly infected teeth must be removed, but the light of honest investigation and analysis must be thrown all through this subject, in order that the patient in the future may not be, as in the past, a victim of reckless, ignorant experimentation.

It is a big proposition! There is plenty of credit and honor in it, enough to satisfy all three—dentist, radiographer, and physician.

223 FOURTH AVE.

[See also *Discussion*, as reported under "Proceedings of Societies," this issue.]

Retracting and Suturing of Soft Tissues with Regard to Extraction of the Impacted Lower Third Molar.

By B. S. GARDNER, D.D.S., Rochester, Minn.

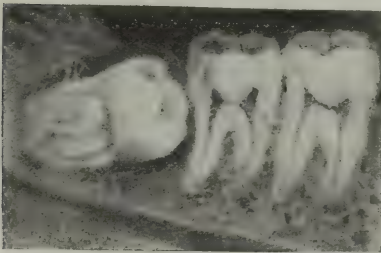
SECTION ON DENTAL SURGERY, MAYO CLINIC.

BECAUSE of the increasing interest shown by the dental profession in the use of sutures following the extraction of teeth, I am presenting this short article—without assuming, however, that the technique is original.

It has been my experience that in order to properly close the socket of the impacted lower third molar, the operator

from the alveolar process, and the resulting flap is held retracted by the use of one suture. (Fig. 3.) This allows

FIG. 1.

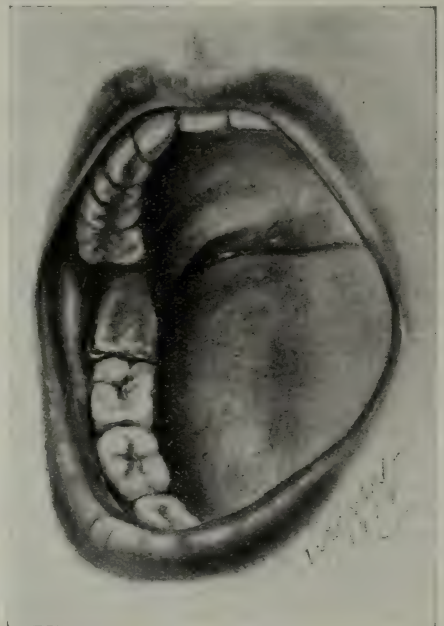


Radiographic picture of a typical impacted lower right third molar.

must proceed with a definite technique with the first incision. He must have in mind that he is to attempt at least to replace the soft tissues in their original position. The steps of this technique are perhaps best described as follows:

Fig. 1 illustrates a typical impacted lower third molar. In order to gain access and to do away with a retractor, a right-angle incision is first made. (Fig. 2.) The soft parts are then separated

FIG. 2.

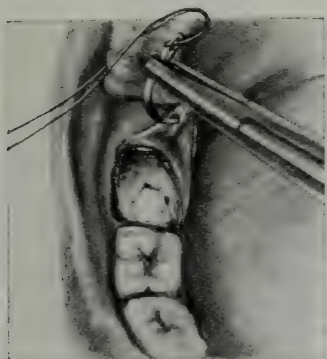


Right-angle incision through soft tissue.

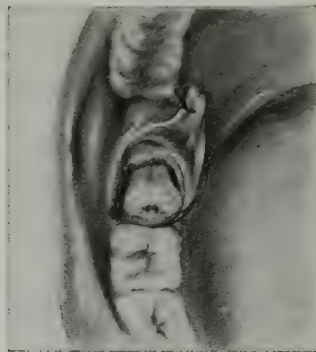
the operator direct access, and whatever technique is used in the osseous dissection, the flap is out of the way and is not misused.

After the removal of the tooth, and an especially prepared catgut known as
 after the socket has been properly cared "special exodontia suture," which resists

FIG. 3.



A



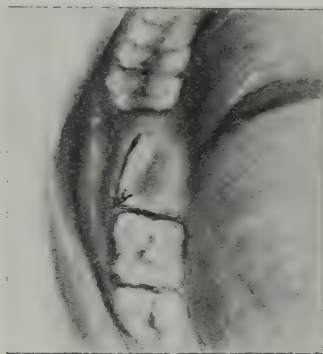
B

A, Soft tissue separated and right-angle flap being stitched. B, Part of osseous tissue removed and soft tissue retracted by use of one stitch.

FIG. 4.



C



D

C, Impacted tooth removed. D, Soft tissue stitched in place.

for, the soft parts are sutured in place.
 (Fig. 4.)

absorption in the average mouth for
 from six to eight days.

The suture of choice in this work is

Pyorrhea and Autogenous Vaccines.

By G. M. HOFFMAN, D.M.D., Portland, Oregon.

IN reviewing one hundred cases of pyorrhea alveolaris, each of which was examined from a direct smear of pus, plus cultures, we have found the predominating organism of the infection to be streptococcus pyogenes. The staphylococci, usually aureus and albus, were present in 30 per cent. of all cases. Spirochetes, fusiform bacilli, mold fungi, and some diplococci are frequently found associated with the streptococci pyogenes. It has been our practice to treat these cases with autogenous vaccines of streptococci pyogenes, eliminating the extraneous organisms above cited.

It may be of interest to note that in but ten cases were the amœbæ buccalis found, the organism which for years was believed to be the causative agent of the majority of cases of pyorrhea.

Before undertaking the use of vaccines, we would suggest the careful perusal of some recognized works on bacterial vaccines; for example, that of Sajous as delineated in "Sajous' Analytic Cyclopedia of Practical Medicine."

We would also suggest close co-operation with the patient's physician for the purpose of complete diagnosis of possible concomitant conditions. It is our practice to chart all complicating conditions. This precaution is necessary lest some other focus of infection be overlooked, in which case the use of vaccine is dangerous.

A few results may be quoted:

In 26 cases of neuritis, in which we were called upon to treat the pyorrhea alveolaris present, we were able to give complete relief in from six to nine injections per case, and all were completely cured after 12 injections.

In cases of anemia, Bright's disease, hysteria, pleurisy, and stomach disorders, we were able to show a marked improvement after the first month's treatment. One case of hysteria and several stomach disorders were completely cured after giving twelve injections of vaccine.

We heartily commend the careful use of autogenous vaccines during the treatment of pyorrhea alveolaris. We all know the value of vaccines as applied to systemic conditions, hence it is but reasonable that they should be effective in this work. Further, a more permanent cure is given.

Thorough scaling and polishing must be done. It is best, however, to permit several days of rest between sittings, as rest is essential in treating all inflammatory conditions. Daily scaling on sore teeth aggravates the periodontal membrane and gum tissue, and is therefore harmful. Pockets should be cleansed with a good antiseptic. We use thymol and bicarbonate of soda for this purpose.

1208 STEVENS BLDG.

CORRESPONDENCE

"Ultero-membranous Gingivitis."

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—In the DENTAL COSMOS for September 1919, Dr. Clarence J. Grieves presents an article on "Ultero-membranous Gingivitis," in which he says, "The treatment of this disease is most decidedly not by instrumentation." In the interest of the large number of sufferers from this disease, I believe this statement should not be allowed to stand without some qualification.

All who have had to do with the treatment of this disease will agree with Dr. Grieves "that no wounds be made or tissues damaged during any phase of Vincent's disease," but to say that "The cleaning and sealing of teeth is absolutely contra-indicated" is, I believe, an unfortunate doctrine to preach in connection with a disease of which Dr. Grieves himself says, "Oral filth, not oral sepsis, appears to be the real factor." Now, the one thing absolutely essential to success in the treatment of Vincent's infection, and one that should take precedence over every other form of treatment, is the cleansing of the teeth and making the mouth as sanitary as is possible. All the instrumentation that is necessary to accomplish this can be done with perfect safety, and must be done if the quickest and best results are to be achieved. This can be done and "no wounds made, or tissue damaged."

Organisms as resistant as are those associated with Vincent's infection cannot be embalmed with mouthwashes and allowed to remain in the mouth; they must be mechanically removed as far as that is possible by the most painstaking prophylactic treatment, which of course should be practiced, as in all cases, with as little injury to the vascular tissues as possible—a precaution observed by every careful operator.

Since reading Dr. Grieves' article a case has come under observation which illustrates better than anything that can be said the inefficiency of drugs, mouthwashes, gargles, etc., of themselves, and the importance of oral prophylaxis in the treatment of this disease. A young man about twenty-five years of age presented with a typical case of Vincent's infection which first manifested itself about a partially erupted third molar, spread to the buccal mucosa, the gingivæ of the upper and lower jaw of that side, the latter being characterized by the usual white slough, and also involving the hard palate at its junction with the soft. The patient had been under daily treatment for three weeks with sprays of different kinds, and had employed as a mouthwash a solution of potass. chloras. During this treatment he had steadily grown worse until he had become unable to attend to his business. Examination showed mouth and teeth exceedingly unclean, badly coated tongue, disagreeable breath, and great physical prostration. At the first visit the teeth were cleansed as far as possible under the circumstances, the gross tartar removed, and the teeth and gums thoroughly bathed in a 40 per cent. solution of tincture of iodine. A 10 per cent. solution of potass. permang. was prescribed as a mouthwash. The patient was seen daily for five days and the treatment repeated, the mouth being carefully sprayed each time.

The relief was immediate. He returned to his work the second day, and at the end of five days reported feeling as well as usual. He was seen twice the following week, after which he was dismissed as cured, all symptoms having disappeared. This is typical of many cases seen in the past ten years, and goes

to show the necessity of the most exacting mouth cleanliness.

For the information of those interested in the study of this disease, I would like to call attention to an article read before the First District Dental Society in 1912, by Dr. Harold S. Vaughan of this city, and published in the *Journal of the Allied Dental Societies*, vol. viii, page 11. No better description of the subject has ever appeared in our literature.

ARTHUR H. MERRITT, D.D.S.

NEW YORK CITY.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—While we are discussing the question of “ulcero-membranous gingivitis,” as outlined by Dr. Clarence J. Grieves in the September DENTAL COSMOS, permit me to cite a case from practice.

A young man visited me recently and presented with a condition of gingival ulceration along the festoons at the necks of the teeth, and general redness and spongy appearance of the buccal mucous membrane on the left side of his mouth only. This condition seems to me to be quite unusual, inasmuch as Dr. Grieves, who quotes so many investigators, makes no mention of the disease being at any time unilateral. If the saliva is so in-

fectious as to cause us to issue orders for the prevention of contamination from patient to neighbor, then how does Dr. Grieves explain the failure of the saliva to carry the infection from the left side of the patient's mouth to the right side? The ulceration, remember, extended from central incisor to third molar in both arches. The right side of the patient's mouth was not only unaffected, but quite normal and pink.

The young man had been discharged from the army two months prior to his visit to my office. He had seen no foreign service, having been stationed in camps on this side of the water, where surely sanitary conditions were, and are, presumed to have been of the best. Inasmuch as the young man had had no trouble with his teeth or gums while in the army, the acute symptoms appearing only recently, would Dr. Grieves eliminate the camp life as an inciting cause of the young man's condition?

By applying a 2 per cent. solution of chromic acid to the tissues, and without any surgery or instrumentation, the condition cleared up within three days. There has been no recurrence of the disease.

M. HILLEL FELDMAN, D.D.S.

NEW YORK CITY.

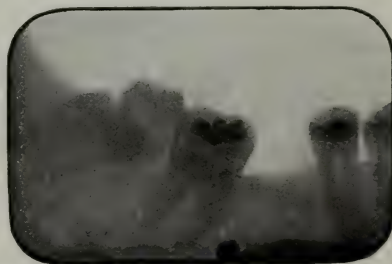
An Instance of Fourth Molar.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—I am sending you a radiograph taken by me of the left mandibular area of the mouth of a young woman of twenty years of age.

The film clearly indicates that there are a first and a second bicuspid, an edentulous space whence her sixth-year molar was extracted some time ago, and then follow, in straggling array, three molars.

The last molar on the film is undoubtedly a fourth molar, and impacted in good measure.



Sincerely,

M. HILLEL FELDMAN, D.D.S.

NEW YORK CITY.

PROCEEDINGS OF SOCIETIES

Pennsylvania State Dental Society.

Fifty-first Annual Meeting, held at Pittsburgh, Pa., April 29 to May 1, 1919.

TUESDAY—*Morning Session.*

THE fifty-first annual meeting of the Pennsylvania State Dental Society was held in the William Penn Hotel, Pittsburgh, Pa., April 29 and 30 and May 1, 1919.

The meeting was called to order on Tuesday morning, April 29th, at 10 o'clock, by the president, Dr. W. A. Spencer, Carbondale.

Rev. SAMUEL BLACK LINHART, D.D., Pittsburgh, invoked divine blessings on the deliberations of the society.

Dr. Spencer introduced the Hon. SAMUEL BLACK McCORMICK, chancellor of the University of Pittsburgh, who welcomed the society to Pittsburgh as follows:

Mr. President and members of the Association,—I am very glad, speaking for the dental profession of Pittsburgh, to welcome this association back once more to Pittsburgh. I understand that you make return visits to this city every three years or so, and I myself remember at least two of your previous meetings in Pittsburgh. Speaking for myself, and also for those of us who are resident here, I extend to you not only a very cordial welcome to our city, and to this part of it, but also extend the cordial hope and expectation that you will have a very pleasant, and profitable meeting.

Pittsburgh has been, like the rest of the country in these last few months,

engaged in practically one occupation—that is, of carrying on the great war. Because of the fact that we are primarily a great industrial center, it happened necessarily that upon this region was loaded a very large share of the responsibility of furnishing war materials. I presume that at least 40 per cent. of the entire output of the nation in such materials was furnished by Pittsburgh and this general region. While we were engaged in this work the one thought of the people has been, as in the rest of the country, upon peace, which has at last been happily concluded. We are now turning naturally to our original pursuits of peace, and in this Pittsburgh is just as eminent in an industrial way as she was in the preparation for war.

While we are primarily a great industrial community, a great commercial community, a community that quickly responded to the nation's appeal in all of the things which have come to us in the last few months; yet, after all, Pittsburgh is something more than merely an industrial city. It is a city that is genuinely interested in other things, counting them also worth while. We believe in every man doing the very best he knows how, in making just as much of a success out of his career as he can, in making as much money out of it as he can; we believe in these things, and we do not pretend otherwise. But we believe also in something more—in education, in the necessity of education in order that all

other things in life may become genuinely worth while. And therefore, not only as one selected by your professional associates here in the city, but as one who represents in a certain sense the dental school as a part of the university, I bid you welcome. I wish, of course, that you might be nearer to that center of our city in which such gatherings as this mostly assemble, and where you have assembled on two previous occasions, but we belong to the same city even if you are not in that portion in which the dental school is located.

I am deeply interested in this particular profession of yours, not only because I have helped to develop the school of dentistry in the university, not only because we have in the dental school the best dean in the United States—and I think I speak modestly when I make that statement—not only for these reasons, but because I have been watching this profession, and with a very considerable measure of admiration. It is making progress every day of its existence; it is striving to attain to the highest ideals of the learned professions, and it is making a success of that striving. People are coming to understand at last how essential this profession is to the public health, and therefore to the public welfare. I have watched you make this progress during these last few years, going from the two and three years' course of study to four years, adding constantly to the general preliminary educational requirement for admission to your schools, and developing among yourselves higher professional standards, assuming the place to which the profession some years ago could not aspire. I want to say to you that I have a very genuine admiration for your profession—and not only an admiration for it, but the disposition to do everything in my power personally to aid in the plans and aspirations that you have for it. And therefore it is not simply to welcome you to our community, where you have come again and again in the past, but as one who is really genuinely interested in the work you are doing, having a high appreciation of its services to the public,

and the belief that you will make in years to come equal progress with that in the past, but for the University of Pittsburgh, for the school of dentistry in the University, and for the members of your profession here in Pittsburgh, I bid you welcome, and express the hope that you may enjoy your session, and that the profession may make a decided step forward in its advancement by reason of your assembling here at this time.

Dr. GEORGE S. SCHLEGEL, Reading, vice-president, responded to the address of welcome as follows:

Mr. President, Dr. McCormick, members of the State Dental Society, and guests.—When I was a student in high school it was my good fortune to have a very efficient professor of Latin, but there were many of the boys in the class who, when the tables were turned, were not quite so efficient in responding in their translations. I remember well the peculiar sensation that would come to me on such occasions, and I had something of the same feeling when I first looked at the program, and saw that it was delegated to me to respond to the address of welcome. General Pershing, soon after he arrived in France, visited the tomb of Lafayette, and after placing a wreath on the tomb said, "Lafayette, we are here!"—a few simple words, but full of meaning. The American army—small, of course, at that time, but nevertheless it was the American army with American ideals—was in France to fight for those ideals that have meant so much for advancement in the world's civilization.

Last April, at our golden anniversary in Wilkes-Barre, we received an invitation to come to Pittsburgh at this time, and today we are responding to the call. Dr. McCormick, "we are here"; we are here in the same spirit that that American army was in France. We are here to uphold the moral, the ethical, and the professional ideals of dentistry; we are here, the representatives of nineteen component societies and thirteen hundred members of the dental profession of the State of Pennsylvania.

We have enjoyed this most cordial address of welcome. We recognize with Dr. McCormick the advance that the profession has made in the last few years, and as I said before, we are here to uphold it. As further proof to you, Dr. McCormick, that we have already been enriched and ennobled before we have been here very long, I move, Mr. President, that the society give both Dr. Linhart and Dr. McCormick a rising vote of thanks for their presence here, and for the inspiration they have given us.

The motion was carried, and the society extended a rising vote of thanks to Drs. Linhart and McCormick.

Dr. Schlegel, vice-president, occupied the chair while the president, Dr. W. A. SPENCER, Carbondale, read the annual address, as follows:

President's Address.

By WALTER A. SPENCER, D.D.S.,
Carbondale, Pa.

For the fifty-first time the Pennsylvania State Dental Society meets in annual session. We are again afforded an opportunity to renew our acquaintance with each other. By our presence we again demonstrate our desire to further the best interests of dentistry in our great state, and to obtain for ourselves the no small benefits derived from such meetings. As a body of patriotic citizens we can look with satisfaction upon the assistance we have rendered in winning a great war. Each component society has its honor flag, and the honor flag of this State Society contains its share of golden stars. Individually we have helped to raise funds; individually we have rendered service.

As we approach normal times, may we not hope to take the advantage of the lessons we have learned in reference to united effort, careful organization, devotion to duty, patriotic demonstration, and as a profession and society work more unitedly toward a more perfect organization, and with devotion and patriotic professionalism strive to make ourselves and every dentist in our com-

munity a bigger man for the benefit of dentistry in general, and our state and component societies in particular?

For this meeting I bespeak for the members a pleasant and profitable session. May you go away well pleased with Pittsburgh hospitality, well pleased with the program provided by the various committees, and entertaining a desire to attend and take part in future meetings.

The years since this society was organized have wrought many advances in our profession: In preparation, from a few months under a preceptor to a four-year course at college, on a foundation of advanced schooling. In equipment, from a barber chair and a hand drill to a dental unit with furniture and fixtures galore.

INCREASED DEMAND FOR DENTAL SERVICE.

The demand for dental service has increased more rapidly than the number of dentists, and a given population will now support many times the number of dentists required a generation ago. Our publicity committees, together with some publicity we are receiving outside the dental profession, are furnishing us with more work than can be handled with ease. The future must hold some solution of this question.

So far, oral hygiene propaganda has produced more demand for dental work than the supply of dentists can adequately meet. In view of this fact, and of the general demand for our services, organizations of dentists should bear in mind the interests and well-being of the middle and less wealthy classes, as well as those of the opulent. I believe there are altogether too few organized local societies conducting dental clinics; and this brings us to the subject of the legalized dental hygienist—a question upon which I trust some light may be obtained during your stay in Pittsburgh.

At our last meeting it was recommended by the Committee on the President's Address that future presidents of this society follow the example of Ex-president Van Horn, and furnish for

publication in the *Bulletin* the address to be delivered at the annual meeting. In part I have conformed to that recommendation, as I am well aware of the advantages of the procedure in case the executive officer has matters of enough importance to warrant action by the society. In many of our meetings important recommendations fail to receive definite action, and are not finally disposed of owing to pressure of business during the sessions, and lack of due consideration by the members and committees previous to the time of meeting.

Several weeks previous to our last meeting, your first vice-president appointed the committee to consider and report on the President's Address. A committee thus appointed, therefore, is able to present a carefully considered report on any points worthy of reference to Council, assuring due consideration and action in the final disposition.

HOUSE OF DELEGATES.

The House of Delegates question has never received due or decided consideration. Reference to Council and a great number of favorable comments are the extent of our action. I would recommend that the three members of the Committee on President's Address, or a man or men selected by them, be asked to present at this meeting a plan whereby something may be done now, or at least next year. If it were possible, I should like to see the State Society, with the assistance of the local societies, paying mileage to these delegates, and a central point selected for the place of our annual meeting. One of the objections to a centrally located point for our annual meeting has been our inability to accommodate a large number of exhibitors, but as the exhibitors have cut loose from us, and our course seems to be toward the so-called Oklahoma plan, perhaps this question is worthy of consideration. An increased membership, which I am confident could be attained by a little more energy on the part of the component societies, stimulated by field work on the part of the State Society, together

with some increased dues, would undoubtedly accomplish the desired result.

THE DENTAL HYGIENIST.

While Pennsylvania has been sleeping and dreaming of the dental hygienist, several of her sister states have been awake, and have accomplished things in reference to this important question. The Oklahoma State Dental Society has a section established at the annual post-graduate meeting for the benefit and advancement of the oral hygienists of their state. New York State has made strides in the direction in which Massachusetts and Connecticut are traveling. We are glad of the announcement that Dr. Midgley of Providence and Dr. Barrett of Worcester are to assist in our awakening, and we have no doubt that Pennsylvania will, in the long run, give an excellent account of herself, with a little better hygienist law and a little better service, through her hygienists, to her constituents than others are giving.

I would respectfully ask this society to take definite action at this time toward a law relative to the dental hygienist, so that at the next session of the legislature the subject may be intelligently and skilfully presented to our lawmakers, to the end that Pennsylvania, the greatest state of them all, shall have a hygienist law second to none.

JURY DUTY.

Several times the subject of jury duty has been discussed before this society. May I hope that an expression of the members may be had at this meeting, that we may prepare, if it be so decided, to present our case through the Legislative Committee at the first opportunity?

I cannot close without expressing to the members of this society my great appreciation of the confidence they have reposed in me by honoring me with this high office. I also desire to thank the officers and committees who, without exception, have worked and are now working for the benefit of our profession in general and the success of this meeting in particular.

Dr. S. B. LUCKIE, West Chester, moved that a committee of three be appointed to consider the President's Address, and report at a later session of the meeting.

The President appointed as such committee Drs. R. H. D. Swing, chairman, King S. Perry, and H. D. Matten, who presented the following:

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

Your committee to whom was referred the President's Address would most respectfully submit the following statement of their opinion.

Notwithstanding the fact that at the meeting of the State Dental Society held in Wilkes-Barre it was recommended by the Committee on the President's Address that presidents of this society follow the example set by Ex-president Van Horn in having the President's Address published in an issue of the *Bulletin* previous to the meeting of the State Society, your committee feels that while this procedure may possess some merit, yet it is of the opinion that the President's Address should be read at the first session of the meeting, and not published in the *Bulletin* beforehand. The reading of the address is always looked forward to with interest by many members of the society, and when it is published in the *Bulletin* and has been read by the members it takes away a very important feature of the opening session of the State Society. The committee feels, however, this is a matter for each president to decide for himself. Where there might be a very large attendance in anticipation of hearing the address, there would be a very few, possibly, who might otherwise attend the first session.

Your committee is heartily in favor of the president's suggestion relative to the House of Delegates, and feels that no time should be lost in presenting a scheme whereby the furtherance of this very important feature of our meeting should be properly brought before the society and adopted.

Your committee would, therefore, recommend that this matter be referred to Council for definite action.

Your committee is heartily in favor of the president's suggestion that our meetings be held at a more centrally located point, if after investigation it is found feasible. This is also a matter that should receive the very

careful consideration of those in authority, to the end that our meetings may be more largely attended.

Your committee is also heartily in favor of the sentiments expressed by your president relative to the dental hygienist. We believe Pennsylvania should be in the forefront in this educational movement, and not bringing up the rear. It is to be regretted that time will not permit the State Society at this meeting to formulate a law and present it to the state legislature, which is now in session. We would recommend, however, that the society go on record as favoring the passing of a dental hygienist law, and to that end would recommend that the matter be referred to the Legislative Committee to draft such a law and present it at the next meeting of the State Society for adoption. It could then be placed in the proper hands to have it passed by the state legislature at its next session.

Your committee would recommend that that portion of the President's Address relating to jury duty be taken up by the State Society at this meeting, and an expression of opinion obtained, so that the Legislative Committee could be enlightened on this subject and be prepared to act if deemed wise by the State Society.

Most respectfully submitted,

R. HAMILL D. SWING, *Chairman*,
KING S. PERRY,
H. D. MATTEN.

The next order of business was reports of committees.

Dr. J. F. BIDDLE, chairman of the Publication Committee, reported that the proceedings of the previous meeting had been published and distributed to the members of the society.

Dr. L. PIERCE ANTHONY, Philadelphia, chairman of the Committee on Dental Science and Literature, presented his report.

[This report was printed in full at page 633 of the July issue of the DENTAL COSMOS.]

Dr. W. H. BOHN, Reading, Pa., chairman of the Committee on Oral Hygiene and Public School Dental Education, presented the following report:

REPORT OF THE COMMITTEE ON ORAL HYGIENE AND PUBLIC DENTAL EDUCATION.

The committee begs to submit the following report:

During November 1918 the committee sent a circular letter to the secretary of every component society requesting the societies to avail themselves of the use of the set of slides and lecture, the property of the State Society. Their attention was called to the paramount importance of instructing the public school children as well as the general public on the very serious problem now confronting the profession in the relation of apical infection to bodily health and disease. Your committee regrets to report that the response was very feeble.

On November 7th, Dr. G. S. Schlegel read a very illuminating paper before the Reading Dental Society, entitled "Shall the Oral Hygienist Become a Reality in Pennsylvania?" After a full and free discussion it was approved unanimously. A resolution was adopted that the paper be placed in the hands of this committee, with a view to bringing it before the profession of Pennsylvania. The paper was read and carefully studied by each member of the committee, and received their unanimous and unqualified approval. Reports of it were made, and on January 9, 1919, a copy was sent to the secretary of each component society, with the request that it be read and discussed at their next regular meeting; the sole object being to crystallize professional opinion in the state, so that an intelligent discussion might take place at this meeting. The committee further requested a report on their respective conclusions in time to incorporate them in this report.

On the 8th of the present month a third letter was sent to the secretary of each component society asking for a report on their respective activities along the line of Oral Hygiene and Public Dental Education, as well as a report on Dr. Schlegel's paper.

Reports were received from a number of the component societies, which are summarized as follows:

SUMMARY.

To summarize the reports, we find the following significant facts, which are self-evident to the progressive dentist.

Three societies were actively engaged in oral hygiene and public dental education work.

Each one approved of the dental hygienist.

Ten societies did not engage in oral hygiene and public dental education. Of the ten, five approved of the dental hygienist, and four out of the thirteen societies who rendered reports are opposed. One took no action.

Summarizing again: Of the 13 societies who reported, 8 are in favor, 4 opposed, and 1 took no action.

Six societies failed to render any report. These societies are morally indebted to the Pennsylvania State Dental Society to the amount of a three-cent stamp—to say nothing of the lack of courtesy in not replying to the request of your committee.

H. W. BOHN, *Chairman*,
FRED D. MILLER,
S. B. LUCKIE.

Dr. J. H. HERTZ moved that the report be accepted, and that an order be drawn on the treasurer for the expense incurred by the committee. (Motion carried.)

There being no further business, the meeting was declared adjourned until the afternoon session.

TUESDAY—Afternoon Session.

The meeting was called to order by the president, Dr. W. A. Spencer, who introduced Dr. ALBERT L. MIDGLEY, Providence, R. I., who read a paper entitled "The Value of the Dental Assistant, and a Method for Training Her."

[This paper is printed in full at page 1085 of the present issue of the DENTAL COSMOS.]

DISCUSSION.

Dr. J. A. Standen, Philadelphia. *Mr. President, ladies and gentlemen*,—This reminds me of the phrase, "It's a great life if you don't weaken." I don't know whether Dr. Midgley lost his hair in training assistants, or whether it is just old age creeping on; but I cannot see that indicating a color is any more simple than saying "amalgam" or "synthetic." The greatest difficulty I see about an assistant is to keep her. If you train them his way (and in my opinion Dr. Midgley's way is a very long way), you have to have a high-grade assistant—much above the average that we

have in Philadelphia—and by the time she gets her colors and numbers all straightened out she may be a grandmother.

Of course we all know it is not the hard day's work that leaves us worn-out at the end of the day; it is the worry of a light day's work. We go home at night and are asked, "How did you make out today?" "Rotten." "Did you get anything accomplished?" "No." "Did you charge anything on the books?" "I don't think we did." Then some days you go home and you have been plugging from morning until night; but everything has gone right and you are satisfied with yourself. You have worked much harder than you did on this light day's work, but you feel that you have accomplished something.

I think Dr. Midgley is working along the right lines. If we can get someone else to do the work, let us do so; but it is an awful job to train a girl, or two or three girls, his way. They may keep them longer in Providence than we do in Philadelphia. Of course he has the right idea, and we all agree with him.

Coming from a state where I believe they have a dental hygienist law, I thought he might tell us something about that. I thought he might be opposed to it, and I should like to ask him what he thinks of it.

Dr. W. W. Booth, Pittsburgh.
Ladies and gentlemen,—I think Dr. Midgley has very wisely made this paper short and concise. It is a very good one; it is timely, and I think it a good thing for all of us to get these good points from a man who has such a hobby. I am very sorry I did not see this paper sooner, as I think we could profitably devote a good bit of the afternoon to the discussion of it. It is evidently a hobby with Dr. Midgley as he has worked it out, and it is a wonder to me how he is able to present the subject so well and talk so well, when he is so quiet in his office.

Personally I could not work very well without talking to my assistant. As Dr. Standen says, it is probably a little less trouble to say to the assistant a certain

kind of amalgam is to be used, rather than telling her by signaling. I should think, with this plan of having a lot of colored signals, the patient would wonder what the blue is for, what the yellow means; it might have an effect on the mind of the patient and it might get on somebody's nerves. But, all joking aside, the underlying principle of this whole thing is wonderful to me, if it is worked along the right lines.

Everyone will agree that the well-trained dental assistant is absolutely necessary in the office. There was a time when we could not persuade very many men into having an assistant; they could not see the necessity of it; they could work along by themselves just as well; but after a while nearly every office boasted of a dental assistant, until now it is simply impossible to get along without one. A great many men have, besides their chair assistant, an extra assistant or secretary who attends to the books, answers the calls on the telephone, and sees anyone who comes into the office. That works out very well in a large practice. Now we come to the time when the busy practitioner employs the graduate assistant or associate in addition to his chair assistant, and the men who have tried this tell me it undoubtedly lessens their work. It takes from their minds a lot of little things during the day. Suppose you are working on a patient and it is going to take an hour to finish, and along comes another patient who wants some little thing done immediately and you have to help him out. You can turn him over to the associate and can easily explain the fact that it is something that he can do just as well as you can yourself; many an operation during the day you can turn over to such an assistant and eliminate for yourself a lot of little work that he can take care of until the time when you are able to take charge of that patient in the more important things. He can take the patient, make an examination, prepare a chart for you, or do some little thing that the patient would know and you would know that he can do as well as you can yourself. After the associate has elim-

inated all these little things the patient finally comes into your hands. Whether Dr. Midgley does that or not, I do not know. If, instead of spending all this time on the colors, he would work this scheme, I am sure he would cut down a good many more hours than he has already.

Dr. Standen spoke about the dental hygienist. Dr. Midgley, not mentioning the dental hygienist, evidently does not agree with the idea, although his state, I believe, does license them. There will come a time when the good dental hygienist will be a great assistance in the office—when they are trained properly and men understand how to use them. I think it would be better to wait until we get to that point; if they can be limited to the definite amount of work that their diploma calls for, and can assist at the chair in the difficult operations, they will be of great use in the office.

There are a number of things Dr. Midgley has said about cleaning instruments. I am sure there are a great many of us in Pittsburgh who cannot clean every instrument in the cabinet every day. I frequently have to turn to the cabinet and pick up an instrument that has not been used since the day before, and sometimes the Pittsburgh soot shows up on the handle; but you make an explanation of that to the patient. I cannot see at the beginning of an operation just exactly every instrument I will require before that operation is completed, but like to feel that every instrument in the cabinet is clean. I think when we are doing root-canal work, where there is a possible chance of getting some septic matter directly into the system of the patient, it is absolutely essential that we touch nothing but what is absolutely aseptic.

In the picture of Dr. Midgley's office, the fact that it is small and compact is commendable. He does not have to walk four or five feet on this side and then four or five feet on that side, and then to the laboratory; he has everything right at his hand. One of the best arrangements I have seen is that used by Dr. Black in Chicago. There is an ad-

vantage in having instruments not in use concealed.

The white is a very good idea in its suggestion of cleanliness; but Dr. Midgley has evidently not had trouble with his eyes—at which I am somewhat surprised. If he would eliminate that glare from below I believe it would save his eyes. It is a bad principle to have all that expanse of white on a level with the eyes. It may not affect him now, but it will later.

If Dr. Midgley's assistant is deaf, she evidently is not dumb, to be able to get all those colors down. It certainly shows he has a good capable assistant. If she can work along that line cleverly he certainly has a gem, and he had better keep on increasing her salary so fast that she will not have any temptation to meet returning soldiers and get married. I know people in Pittsburgh who are having that experience. It is a constant nightmare.

The idea of using these written instructions is a very good point. A good many so-called assistants are not trained. They sort of grow into the business of being an assistant. Very few men talk to their assistants and try to train them to this point. A bright girl can study that out and can often do things that he will never have to bother talking about.

Dr. T. W. McFadden. Wilkinsburg. I have had a little experience in training assistants, and I just want to say that I think the paper is very fine, and shows that the man who wrote it has given it a great deal of thought, and unquestionably he has been able to work out a system that certainly must be a great benefit to him and helps him accomplish more in his practice. My system is entirely different. I could not adopt his system because I am color-blind. I even have to call my assistant in to match up a tooth color. The main thing, I think, in an assistant is to get one who can read your thoughts—one who can foresee what you want.

Some time ago I was preparing to leave the office and there was something that I felt I wanted to do, but I didn't know what it was, and my assistant said,

"You want to take off your glasses." And that was actually what I was fidgeting about. She read my mind. That I think is the biggest thing of all—to get a girl to try to think for me when I am doing an operation and have certain instruments that I use for that particular operation. She gets so she knows what instrument I need as well as I do, and whether it is going to be an amalgam filling or whatever it is, she reads my mind and gets the things that I need ready for me. It seems to me that is the most important thing to instil into any assistant. For me to lay down a set of rules and numbers and all those things—I cannot come to that. If a girl has not intelligence and foresight enough to read me, she is not much good to me.

Dr. R. E. Denney, Philadelphia. This is an exceptionally practical subject and I believe every one of us could get much practical good from it, if in our discussions (instead of speaking in generalities) we would mention some of the practical things we ask our assistant to do. Each assistant that I have had, and I guess we are all unfortunate enough to have to change often, because young girls have a way of getting married, I have found to be much more efficient and helpful to me than the last, because I have been able to teach her more things. The longer she stays with me the more she is able to do. In addition to keeping the books and making appointments, attending to the correspondence, answering the telephone, my assistant does many other important things. I don't think any patient should expect a dentist, except in rare instances, to leave the chair to answer the phone or make appointments. The assistant should attend to that, and one's practice can be trained to expect that. It is wonderful how much work in a laboratory an assistant can do quite as well as we can. Cast gold inlays and work of that nature, for instance. After receiving the wax model my assistant returns to me the finished casting without any help from me, whether it be inlay, cast base for porcelain crown or cusp on a gold shell crown. My present assistant

has only been with me a year, and I am sure if I can keep her longer there are many more important things she can learn to do. The assistant can develop X-ray films perfectly satisfactorily. If we are to develop assistants quickly, one must not be afraid of their making a few mistakes. It is thus that we all learn. Let them try anything that you believe to be within their capabilities. The way to make trustworthy assistants is to trust them.

Dr. Chas. E. Peters, Pittsburgh. Everybody has been taking a fling at Dr. Midgley on account of his buttons, colors, and other paraphernalia. I want to say that he has shown himself to be an ingenious efficiency expert. We are not all so ingenious, and among us there are so many offices so inefficiently operated that I consider it a great benefit to have someone tell us occasionally what can be accomplished along this line, so that we may be spurred to attaining better results.

It is difficult to understand how any dentist can get along without the aid of an intelligent assistant, at least one to care for the reception room and give some aid in the operating room. A dentist's occupation is such that if he can keep his time occupied in operating he should do so, and not do anything that he can train an assistant to do. It requires time and patience to make an assistant valuable, but it is well worth the effort, and with two, one for the reception room and the other trained for operating room and laboratory, it is possible to greatly increase our business with less annoyance from petty details. My operating assistant has been with me seven years, and can now aid me very greatly in laboratory work, such as soldering bands while I am preparing teeth, casting inlays, pouring models, selecting teeth, and even doing my personal shopping for me. She seems to enjoy the diversity of the work rather than the monotony of special work.

I repeat that we need good men like Dr. Midgley to come among us occasionally and awaken us to the possibilities.

Dr. Jas. M. Prime, Omaha, Nebr.

Mr. Chairman, ladies and gentlemen,— You will probably hear enough from me without calling on me at this time; but I want to congratulate you on having a man who can read such a paper as you have heard today. I think that is one of the most eloquent essays I have ever heard. You may differ with Dr. Midgley, as some of you have proved you do, as to method; but you cannot differ with him on the manner in which he handled his subject. His reference to psychology, his hints to all of us as to what it takes to constitute a dental operation, are extremely valuable. We are not thinking enough about the long-continued physical and mental strain under which our operations hold us. We have perhaps the most difficult work to perform of any group of men of which I have any knowledge;—that of a surgeon going to his operating room in the morning and there operating on patients until 6 P.M., and keeping it up for years—undertaking, I should say, to keep it up for thirty years—and keep at the zenith of his profession. We are struggling against impossibilities. Dr. Midgley has shown us how we can secure a greater degree of efficiency from our dental assistants. The dental assistant is the most important factor in our office. The money we pay her, if she is the proper girl, is the best money we spend, and no man can practice dentistry without one at least, or I should say two assistants, and I am surprised when from all over the country I hear men say they do not have an assistant. To undertake to practice dentistry without an assistant is seemingly to me an impossibility, and to train her as the doctor has suggested today is unique. To train her as he suggests seems to me rather difficult, yet his method has some splendid features. You can apply your own methods along his lines to secure better results. There are too many of us satisfied with slipshod methods. Could any man expect the assistant to know as much about an operation as you do? Do we take the necessary amount of time and trouble to train our assistants? You say to your assistant, "You did not have a glass there

for my patient." Perhaps you have never told her that she should have. These girls must be trained and talked to like real human beings—and, believe me, when you do you will get your reward. I have had some difficulties, and with me the training of an assistant has been an important subject; there are some things that I have learned that have been of value to me. Dr. Midgley allows his assistant to write "Mrs. Brown." In Omaha there is no such person as Mrs. Brown, as far as my office is concerned. There may be twenty Mrs. Browns; so she must write that name out so I will know which Mrs. Brown it is that is coming at that time. That is just a suggestion.

Then I would like to ask the doctor how he can determine beforehand what kind of an operation is going to be required in a tooth. When he applies the rubber dam he thinks he will make an inlay; but after he explores a while he discovers it is not a case where he can make an inlay, but is one where he will put amalgam. Then he goes a bit farther, and finds the pulp is hopelessly complicated; and then, after planning for an hour, he finds he has to put a temporary experimental cement filling in the tooth—and he finds that, after all, the marking up of an allowance of thirty minutes for an operation was a very meager guess. I should like to know how the doctor handles a situation like that. I never come out even in an estimate of time; I find difficulties arising that I did not anticipate, and I keep people waiting in my reception room for me. Lamentable, to be sure! It used to be irritating; it is so no more.

The essayist, I see, has his cabinet on the right-hand side, as we view it, of the chair, but, from his position, at his left hand. With the assistant there that would be a very awkward position for me. My assistant hands all of my instruments to me. She knows the instruments I need, and hands them to me as I need them. Let me say here, before I forget it, the best assistant is the one who knows the most about the operation that I am going to perform, whether it

be lady or gentleman. Give me the best man on gold inlay work in this room and he is the best assistant I can have for that character of work. The more your dental assistant knows about the operation you are going to perform, the more she will assist you. I tell my assistant she must read the magazines, she must study the subject, and know what to do when a difficulty arises. When a little saliva leaks into the side of the rubber dam, do you think I have to tell her? No, she knows it before I do. When I get into trouble she can tell it by my physiognomy. No assistant can properly assist until she understands the operation we are going to perform.

I would like to know about what remuneration Dr. Midgley gives his girls. That must be considered, and if you will pardon me for personal reference, I will say that I pay my dental assistant a commission. I give her \$80 a month and a commission of 5 per cent. on everything above \$500 cash and collections each month, and she naturally wants to make that as big as possible. She has an interest in boosting my business, and if there are two patients fighting for time, the one who is the best pay is the one who gets the appointment. Of course it suits me, and there is no argument. If one is good pay and another is poor pay, the one who is good pay gets the preference. She handles that for me.

My secretary, who is quite important and without whom I do not know how I could conduct my office, is just as much an assistant as my dental assistant. She takes care of the clerical end of the business; she does most of the receiving of the patients; she takes care of the telephone calls, and we have our signals back and forth. She takes the messages and delivers them to me. That feature has not been mentioned. I do not see how one can get along without a dental secretary.

Dr. W. W. Booth, Pittsburgh. There was one question that I forgot, and it is rather a question to Dr. Friesell. In view of the fact that the dental assistant is such an important item in the work of a dentist, why would

it not be possible to have the schools take up that question, and train dental assistants—not dental hygienists, but dental assistants, training for us good girls that are capable. I am sure there would be a good field for them, and coming from good schools I am sure they would be in demand. If such a thing is possible I should like to hear from Dr. Friesell as to what he has to say on that subject.

Dr. H. E. Friesell, Pittsburgh. I think I can say that the dental schools of the country would much rather undertake the training of dental assistants, or formulating a course of training for dental assistants, than they would to attempt to train hygienists. In the four-year course, of which we are now finishing only the second year, there will be an opportunity with the better class of institutions to do many things that it was only possible heretofore to think about and to wish for, and I hope this important feature of dentistry will be taken care of by the schools, in the same way that a great deal of necessary study—before-graduation work as well as post-graduate work—will be provided by the schools. These things were impossible in the old three-year course, because we had not the time. I think Dr. Midgley's essay has presented to all of us something we can take home and study carefully. Speed in operating can be gained much better by elimination of waste time and energy than by anything else, and if we will only put more thought into our work and train an assistant to do those things which would take only just as much of her time as it would save of ours—if we can train an assistant to do as much work in a day as the operator can do, the operator has doubled his time.

A beautiful thing about Dr. Midgley's system is that he has put down in black and white, in logical and sequential order, the things that he would do, so that the assistant does not have to look at him and guess what he will require next. The assistant has it down in black and white, and if she is in doubt at any time she can refer to her instructions.

I am sure that when an assistant leaves Dr. Midgley he is not greatly worried, for he can refer the next assistant to the printed instructions, which give the necessary information as completely as the doctor could teach her. Dr. Midgley has shown us what appears to be a very complicated system; but he has shown us practically the ultimate in the application of efficiency to the dental practice. Most of us, if we attempted to start right in to copy Dr. Midgley's system entirely, would be so tangled up in wires and colors and buttons that we would be lost; but do not think for a moment that Dr. Midgley evolved this thing overnight. It is a matter of years of training and thought on his part, and while it looks complicated to us it is not complicated to him, and it has simplified things for his assistants, and he is reaping today the reward of putting thought into dentistry, and not just simply manual labor. I wish Dr. Midgley would put into book form many of the things to which he has referred. I have talked to him many times, but if this thing were put into book form where a dentist could buy this information and decide what part of it he could economically adapt to his own particular practice, and then turn the book over to a competent assistant and show her what to do, he would be doing a mighty good thing for the dental profession.

Dr. Midgley (closing the discussion).—I appreciate very much the discussion of the paper and the criticism of it; that is what I wanted to get. You might conclude that possibly I have been riding a hobby—and sometimes we ride them a little too strenuously. The reason for my appearing before you and giving this talk is because I thought I might learn something myself. I shall attempt to answer briefly the questions that were put to me; but I realize you are possibly wearying of the subject.

With regard to the difficulty of keeping a dental assistant, there is only one hazard, and that hazard is marriage. The general difficulty whereby men do not keep their assistants lies in the fact

that they do not pay them enough salary. Reflect on the young women who have left your office; how many have left for the purpose of marriage only? Most of them have left because they could get a better position. The last four who left me left because they were to be married. That is the only hazard.

Relative to the hygienist or dental nurse, I much prefer to leave the discussion of that until Thursday afternoon, when Dr. Barrett will take up that subject. A year ago this winter the Rhode Island Dental Society opposed a measure that was brought before the legislature for enactment, for licensing dental hygienists, and it was lost. We do not have such a law in Rhode Island.

Dr. Standen suggested that the patients would wonder what was going on with the signals. It is silent and they never know it is going on. If I am going to do any talking I talk to the patients, but most patients do not wish to carry on conversation. They do not come for social entertainment; they come for professional reasons, and most of them are very glad to leave the most painless operator as soon as possible.

My first assistant has been with me four and a half years. Last year her salary averaged \$28 a week. She is paid \$23 a week; but at times when she has worked hard or was going on a vacation she was given some extra compensation for her services, which brought the average up to \$28. She is told in the beginning that those who never do more than they are paid for are never paid for more than they do, so she is usually looking out for her own interests. These assistants frequently become worked up heart and soul in the matter, and are much more interested in some of the details of an operation than you are yourself. I have had one girl since last October, and in six weeks she was an excellent assistant. So I am having her trained, because my first assistant was married last January, and is going to leave me in June. I prevent these lags in efficiency by spending money, and secure a good return on the investment.

I also get a splendid return in the physical and mental quietude that I have in a day's work; it is nothing practically but play.

I think it to my best advantage to get young women, say from twenty-six up. I have had the eighteen-to-twenty variety, but they are not as dependable as when they are five or six years older. I want brains first, then cleanliness and attractiveness. I would just as soon have it, but I do not insist upon beauty, for which so many men look. Mental capacity and attention to work, combined with cleanliness, is what I look for, but I do not mind if beauty is there as well. As to the hours of work, they are from the time I begin until I leave, giving an hour and a half for noon.

Dr. McFadden spoke about the colors being bewildering. I think perhaps the way I presented them it would give that impression, but if you come up to Providence and see it I think I can show you that it is not so. You can see it in half an hour. It seems intricate, but it is not, having been evolved over a period of years—it didn't come overnight. I have observed a great many things and gotten a great deal from dental meetings, and find the silent method of signaling is far superior to any other method for my practice. I am not jumping on those buttons all the time, as some one intimated. My patients say to me, "Isn't that an excellent nurse you have?" The nurse is competent, of course, but they don't know that she has been told everything; and if she forgets anything it is in that book, where she can see it. How does she learn the instrument I need? She learns what the broken-back excavator or the marginal trimmer or the plugger is used for; she has those instructions in the loose-leaf ledger, and if I change the procedure for an operation I tear that page out and put in a new one. I do not have to teach her, and tell her this is this and that is that; she learns that for herself. My assistants have an understanding with me that they are to give me three months' notice when they want to leave.

Dr. Prime's suggestion of giving Mrs. Brown's full name is a good one, and I shall take it home to myself.

I cannot determine at first glance what operation I have to do; but if I need to change the operation, I press on the proper button, and that tray is taken off and a new one brought in, and it is treated as another case.

The business end of calling patients the night before is very good. In my practice, in every anesthetic case there is always a solicitous inquiry goes out, and note is made of that. I do not have to say, "Do that"—the trained assistant does it without being told. She knows whether that patient has been subjected to unusual strain or not, and she writes on a blue slip, "Solicitous inquiry about Mrs. Brown." Many a time it saves me coming back to the office after night to check pain after extraction.

Relative to the equipment: The cabinet is on my right and the young lady assistant is back of me. We are not in the least in the way of each other. There are certain things that have to be taken out and cleansed, and this is done before the next patient is brought to the chair. They do not come so intensively that I have to keep my nose to the grindstone from sunrise to sunset. Three girls take care of my work. One woman does nothing but sterilize instruments all day for the three operators. If she has any spare time she makes cotton rolls and things of that kind. She comes in early in the morning, and cleans the office. The other girl is the secretary, and the girl who is with me all day long is the trained assistant. When I want her to leave the room I let her know by pressing the light, and she leaves the room; that sometimes relieves us of an embarrassing situation. As one man has said, the trained assistant thinks for you; but you control her thoughts, as I said, with a minimum of mental and physical effort. The training of them with this loose-leaf-ledger book is very simple. The one I have had occasion to try it on is developing, and I feel gratified with the results.

I thank you for your wholesome criticism as well as for the complimentary comments on my paper.

On motion, duly seconded, a standing vote of thanks was extended to Dr. Midgley for his paper.

Adjourned until the evening session.

TUESDAY—*Evening Session.*

The meeting was called to order at 8 P.M. by the president, Dr. Spencer.

The President introduced Dr. M. M. House of Indianapolis, Ind., who gave an illustrated lecture on the subject of "Standardization, and Its Successful Application in Full Denture Construction."

On motion, duly seconded, a rising vote of thanks was extended to Dr. House for his excellent address.

Adjourned until Wednesday morning.

WEDNESDAY—*Morning Session.*

The meeting was called to order at 9 A.M. by the president, Dr. Spencer.

The President announced as the first item on the program for the morning session the reading of a paper by Dr. O. L. HERTIG, Pittsburgh, Pa., entitled "A Question in Inter-Professional Ethics."

[This paper is printed in full at page 1088 of the present issue of the DENTAL COSMOS.]

DISCUSSION.

J. A. Lichty, M.D., Pittsburgh. *Mr. President and gentlemen of the Pennsylvania State Dental Society*,—I rise particularly to show you that I am still here, and what might surprise you more, to say to you that I am glad I am here. I am really grateful. I feel toward Dr. Hertig as I feel toward my wife when I am ready to leave my house and she tells me my stickpin is crooked, or that I have a black spot on my face, or that my breath is heavy, because those

are things I want to correct before I go out to appear before my *clientèle*. That is the way I feel toward Dr. Hertig with regard to the points he has mentioned. We ought to see ourselves as others see us. I suppose Dr. Hertig has gone about this upon the principle of the "golden rule," which of course we all recognize, and I suppose he has also been following the scriptural injunction to go to our adversary quickly—straightforward. We are two together here, and I suppose if we cannot agree we shall ask a third party to come in, and perhaps we can agree on all these points. That is the principle upon which they seem to be proceeding on the other side; but something seems to be holding things up. In this case, however, we shall talk plainly.

My relations with the dental profession have been very happy. You men have helped me out on many difficult problems. The unhappy point was when I came to you too late, after the damage had already been done. There are several points which have not always been agreeable, but which probably are just conditions which arose on account of individual inclinations. People do not all follow the golden rule, and they get into these troubles which have been shown to us this morning. If I name two or three little differences this morning, I hope no offense will be taken, but that it will be accepted, just as we are ready to accept your criticism.

There is one point that I want to refer to—it is human nature, as Dr. Hertig has said; that is, that the family dentist or the dentist who has done work in large amount is slow to recognize any fault in his own work. That has stood in our way to the extent that we sometimes have thought we would have to sacrifice the life of a patient rather than go to the dentist and tell him he was doing that. You know yourselves that is our position; I need not speak to you about it. If roots are left under a bridge, and this goes on, it is difficult to get the dentist to recognize the danger of those roots and go after them. That is human nature.

Another difficulty we have is the same that we have in our own profession—the medical profession. We send a patient to a nose or throat man and ask him his opinion on the tonsils, or whatever the question may be, and he sometimes forgets entirely what the patient is sent for, but gives an opinion on the general condition of the person. He thinks he is going to help me out. He says, "These tonsils are probably diseased, but I think they have nothing to do with the general condition of the patient." That is the question which we like to work on, and which we think we should work on, and for which we are responsible. Sometimes you get the same kind of a report from a dentist. We do not criticize the dentist for this; we just say it is human nature.

We have another and third difficulty, and when I am through with that I am going to take advantage of this opportunity and tell you what I think about certain things. The third difficulty is the misunderstanding or apparent misunderstanding which comes from two radiographers, the dental radiographer and the so-called medical radiographer. My experience is that the dental radiographer, if he goes about his work conscientiously, is the one who should do the dental radiography, because, in medicine, if I have a series of X-ray plates and I go to the consultant and ask him to pass an opinion, he will say, "I would like to have my own plates." I can see how that would be important between the dentist and the medical man. We hold certain principles inviolate. That is, we send a patient to the dentist for his opinion, and want him to have every opportunity to establish an opinion. Those are the things which we send the patient to the dentist for, and he should have every opportunity to back up his opinion; therefore he should take his own X-ray plates, if he is able to do so, or he should name a man in whom he has confidence. So I think that is a question which can be settled very easily. In fact, there are a number of these questions which can be settled very easily if we just get to-

gether. I believe Dr. Jones can offer a solution—a kind of "league" program which will help us out of the difficulty.

What I want to speak about particularly, if I can have a few minutes, is the kind of professional relations we should establish through the hospitals. My work is largely in the hospitals, and I am much interested in it. Your secretary here has helped me out of many difficulties, and I would like to speak of the relation we have established there and which I think should be established, as it would help us out of many perplexities.

Every hospital which pretends to do good work should have a dentist on the staff. He should be a staff member, and should have all the powers that go with staff membership. He should be recognized by the trustees of the hospital, by the superintendent of the hospital, and by the staff of the hospital, as an equal. I believe that is the only way we can solve the problem.

Then there is the question of remuneration. We know you do a good deal of charity work. I heard in Chicago last June of the amount of work your profession has done in the army. We know you can do that in your own community, but when it comes to the hospital, the question is raised, "How can I afford to do it?" We have no trouble about this in the hospital in the medical profession. Our remuneration comes from those who are able to pay, and who demand accommodations in the hospital which show they are able to pay. Those who go into the wards we do not charge, but do our work there gratis. They are frequently not able to pay for their own beds.

We feel that the dentists should be on the same basis with us, that the work of the wards should be done free, and that where a physician collects a fee the dentist should collect a fee for his services as well.

We should have a man on the staff of the hospitals as director of the dental department. Then he will have to have an organization; he will have to have a first assistant, a second assistant, and a

dental resident—a man who will be recognized at the end of the year with a diploma or whatever is given to the medical man under the same circumstances. You will say again, "How can this man afford it?" Well, the medical man affords it. "How can the first and second assistants afford to do that?" This will have to be done by turns. There will have to be so many days assigned for this man and so many for that man, so that the field can be covered. Then there should be in that organization a dental nurse, who will be interested in your work and who will understand the work in the mouth. Such an organization will have to exist before we come to your ideals and to our own ideals; so I am much in favor of getting together on that point—that is, establishing a more definite relation between the dentist and the physician in the hospital. It can be done; it will have to be done. It was done in 1902 in New York hospitals, and there are very few hospitals now that do not claim to have a dentist, but I doubt very much whether they have the organization that they will have to have to do the work efficiently. It will require a large organization in order that the work may be done properly in the ward and private room and laboratory. Until we have such an organization our relations are not going to be satisfactory.

I am so interested in this that I am afraid you will think I came here purposely to speak about it, instead of discussing this paper; but it is the first opportunity I have had to get before any of your organizations and say what I think we will have to do before we can solve the many problems which have been presented in this paper. I believe when we come to do these things, the men who are taking advantage of a fad—as it will become, if we are not careful—will have no place to stand.

I thank you for giving me this opportunity of telling you what I think on the subject.

C. R. Jones, M.D., Pittsburgh. *Mr. Chairman and members of the Pennsylvania Dental Society,*—I want to preface

my statements and my suggestion of a remedy for the situation of which Dr. Hertig has given us a horrible example, with the remark, "Let us be honest, if we are ignorant." I think that will apply to the whole situation. There has been little instruction, we might say no instruction, given to the student in the dental school, and certainly nothing to the student in the medical school, as to the manner of procedure in consultation with our brother practitioners—so that the situation can be attributed in plain words to ignorance. It does not seem to me to be wise to make comparisons; they are always bad, and while we recognize the evils that have come because of a new situation that has been sprung upon both the medical and dental professions, we all recognize that we have much to learn. My rather close association with dental teaching for a period of twenty-five years has made me pretty thoroughly acquainted with the situation on both sides, and for this reason I was chosen as chairman of a committee of the Allegheny County Medical Society to prepare rules of ethics to be concurred in by a committee of the Odontological Society of Western Pennsylvania, of which Dr. Friesell is chairman. I wish to present that rule this morning for consideration by your state body. I hope it will result in your appointing a committee to adopt such a rule. The rule is as follows:

CONSULTATION BETWEEN PHYSICIANS AND DENTISTS.

When a patient of a physician is found to require examination as to the condition of the teeth, the physician should inquire as to the patient's preference among the available dentists. If the dentist named be recognized as ethical the physician shall communicate to him a request for an examination and a report on the condition of the teeth. When radiograms are desired, the dentist shall have such radiograms made, and their interpretation be subject to a joint consultation between the physician, dentist, and radiographer as to the advisability of operative dental measures.

It will take some thought and consideration on the part of the committees

to digest that rule. It has several points that might not appear at first sight. The selection of the radiographer is left to the dentist. I agree with Dr. Lichty that the radiographer should preferably be a dentist, because we get the expert advice of the dental radiographer, and that is no small part of such a consultation. The consultation, finally, in that case would consist of two dentists and one physician. As the condition is a mouth condition, I think that wise. The systemic conditions which may result from the pathology existing in the mouth may be determined, and the advice of a physician sought as to that phase of the case, but the local condition in the mouth, together with the radiographic records, should be interpreted by the dentist, concurred in and discussed with the family dentist or the dentist consulted. It seems to me if we follow such a rule the results will be happy, and the problems which have been discussed by Dr. Hertig in his paper will be avoided.

One other point in this consultation which is important, as it seems to me, is that dental societies should prepare a list of their members for distribution among physicians. At least some knowledge should be placed in our hands whereby we can decide, when called upon by a patient, whether or not a dentist is in good standing and an ethical member of the profession, so we may not be found consulting with men who are not following the ethics of the dental code.

Dr. W. H. Fundenberg, Pittsburgh. I want to say that both professions are partly to blame for the condition of affairs as they stand today. Twenty-five years ago many dentists recognized that there were conditions existing in the mouth that had much to do with general systemic conditions. If the dentist suggested this, the physicians did not have any faith in it. There was one man in this community who recognized this, and that was Frank LeMoyné, M.D. I know of lives having been saved by the removal of this cause of trouble. The dental profession is partly to blame for this state of affairs, from the fact that for twenty-five years they have crowned

teeth and left old roots in the mouth. They have produced conditions that never should have been allowed to exist. I made the statement before a meeting of this body at the Schenley Hotel a few years ago that 50 per cent. of this work should never have been done, and now I say 75 per cent.

The time has arrived when the medical and the dental profession are going to get together. The excellent paper read by Dr. Hertig and the way it has been received by representative medical men indicates plainly the trend of affairs. We will have to discard this indiscriminate bridging and crowning, and come back to better, well-adjusted plates, and as soon as the medical profession finds that we are working along these lines they will agree with us.

Dr. Ross Porter, Oil City. I enjoyed Dr. Hertig's paper very much. I think he should read it before a joint meeting of medical men and dentists such as we had here a few years ago. But what is the remedy? As Dr. Hertig said, many medical men are standing on a pedestal before the people; but we are not going to get anywhere by trying to shove them off and getting on the pedestal ourselves. As Dr. Jones says, take the attitude of consideration for the patient! One man has said somewhere that a hospital is run for the benefit of the medical staff; it should be run for the benefit of the patient. If we can show a physician that we are reasonable and understand that they know something about the subject, and also show that we know something about it, we can get a reasonable hearing in almost all cases. If we try to show them that they do not know anything about it, we will naturally be turned down. There has never been the co-operation between the dentist and the medical profession that there should be, and whether or not we get that co-operation within the next year or two depends largely upon the dental profession. When a physician examines a patient and discovers endarteritis or pericarditis or high blood-pressure and some other things, and finds an abscess discharging pus into

the mouth and sends the patient for an X-ray examination, which discloses a pus sac as large as a good-sized pea, and when the patient goes back to the dentist and he declares there is no abscess there, what position do you expect the physician to take? We must correct our attitude toward the medical profession, because we cannot hope to correct that profession. I have had physicians send in patients who wanted a plate of the whole mouth, when anybody knows you cannot get it all on one plate. But I have found others reasonable, and perfectly willing to co-operate.

Dr. Chas. E. Peters, Pittsburgh. I think all of us are more or less uncertain at the present time in regard to mouth conditions and their consequences. Dr. Hertig's paper, which I am sure we all enjoyed, is a just denunciation of a class of physicians who from lack of consideration of the patient's welfare, with disregard for the ethical relationship to the dental profession, or ignorance, are quick to unload the responsibility by taking snap judgment in the case, and laying the cause of the troubles to the patient's teeth. They may, however, be sincere in their convictions, and, lacking any knowledge of the value of co-operation of the patient's dentist in aiding the diagnosis, and having no regard for the ethics of his position, are having cases radiographed by any radiographer, whose written diagnosis they consider sufficient, and from which they possibly send the patient to an exodontist or hospital to have certain teeth or all of them removed, never considering the great loss in masticating efficiency which occurs where some of the teeth removed could have been safely retained. In my practice I have a considerable number of patients in the medical profession in addition to others, whom I enjoy as friends, and I am glad to say I find that nearly all of them are seeing this matter in the proper light—that is, when treating a patient and suspecting abnormal mouth conditions, they refer him to his dentist for examination. If he is not qualified or sufficiently interested to go into the matter thoroughly, it gives the med-

ical attendant some justifiable reason for referring the patient to a dentist who will aid him. It is not such men that Dr. Hertig's paper is aimed at, but the unprincipled or unthinking men who do not have a conscientious regard for the physical betterment of the patient. Some are well qualified in medicine, but fail to realize that their knowledge of the pathology of the teeth and investing tissues is only on a par with that of the average layman. I make that statement from the type of questions asked me by some of my medical patients who stand high in their profession. I say that no man can diagnose a tooth condition from the radiograph alone, or from a physical examination alone, but only by the aid of both, together with what history of the case is available, can the dentist come to a conclusion and be able to consult with the physician, if referred by one.

From my experience with radiography I have found many cases in which the X-ray showed normal conditions, but upon examining the mouth have found most abnormal or putrid conditions.

I think Dr. Jones' plan for a solution of this problem a fine one, and commend his broadminded view of the matter.

Dr. T. W. McFadden, Wilkinsburg. It seems to me the friction is not all between the medical men and the dentists. There is a lot of friction in the dental profession that needs to be cleared up before we can expect the medical profession to accept our diagnosis. I have had a great many cases referred to me by medical men, where they say, "Extract this tooth," but never ask advice or an opinion or anything else. They think we should take the order from them, and do what they say. Just a short time ago I had a man come in who had a couple of radiographs of the whole jaw. The physician told me the lower jaw was broken on one side, and requested me to extract two loose teeth on the opposite side. It developed that the jaw was not broken on the side he said it was; it was splintered on that side, and on the other side the jaw was broken, which gave the symptom of two loose molars. The physician had been

treating that patient for six weeks, and did not know his jaw was broken. I find a great many physicians in the community where I practice who send patients in and ask my opinion regarding the condition of the teeth. They rely on the opinion I give them, and do not pretend to diagnose tooth conditions. But we find some medical men who have the idea that they know it all. These fellows are just like the dentist who thinks he knows it all. What we need is to get together on a plan such as Dr. Jones has indicated.

The President. Our time is growing short, and I shall now ask Dr. Hertig to close the discussion.

Dr. O. L. Hertig, Pittsburgh (closing the discussion). The general discussion of this paper ran true to form, along expected and normal lines. I appreciate many of the points put forth. I wish the discussion had been more general.

I am pleased, gratified, humiliated, disappointed, and otherwise;—I would like to find another term to express my feelings with regard to the medical discussion. They did not discuss the paper. It was like the farmer's beagle hound I shall have to tell you about. I was traveling out in the country, and met a farmer who had a beagle hound that he said was good for groundhogs and rabbits. He put him on a groundhog's trail, and he followed it all right until he came to where a rabbit had run across the trail of the groundhog, and then he chased off after the rabbit. I suppose he didn't want to tackle the groundhog.

Dr. Jones' suggestions were admirable, and Dr. Lichty's discussion was well-balanced and timely. I was very much flattered to have Dr. Lichty get up and say, "I regard Dr. Hertig just as I regard my wife." That crooked necktie pin or that smut on the nose or the heavy breath is important, and the man

who goes to meet his patients with a heavy breath, a crooked tie-pin, or a smut on the nose presents a bad appearance, and if my paper has been able to show Dr. Lichty just where his stickpin is awry, and just where the smut is on his nose, and just how his breath is heavy, so that he can go about correcting the evil, its function has been performed.

On motion, duly seconded, a standing vote of thanks was extended Dr. Hertig for his paper.

ELECTION OF OFFICERS.

The society then proceeded to the election of officers for the ensuing year, with the following results:

President—Dr. G. S. Schlegel, Reading.

First Vice-president—Dr. R. H. D. Swing, Philadelphia.

Second Vice-president—Dr. J. F. Biddle, Pittsburgh.

Recording Secretary—Dr. W. L. Fickes, Pittsburgh.

Corresponding Secretary—Dr. O. J. Specker, Reading.

Treasurer—Dr. A. B. Miller, Kingston.

Board of Censors—Drs. Bruce P. Rial, C. V. Snyder, Wm. J. McKinley, F. H. Hayes, and W. H. Fordham.

Board of Examiners—Drs. W. A. McCready, T. A. Hogan, J. C. G. Fitzhugh, and J. D. Whiteman.

The President stated that Dr. Fickes' having been elected as recording secretary made it necessary for four men to be elected to Council, the member receiving the lowest vote of the four elected to serve for two years, the unexpired term of Dr. Fickes.

Members of Council—Drs. R. E. Denney, H. E. Friesell, L. Waddell, and Z. T. Jackaway (to fill the unexpired term of Dr. Fickes).

Adjourned until the afternoon session.

(To be continued.)

Dental Society of the State of New York.

Fifty-first Annual Meeting, held at Syracuse, N. Y., June 12, 13, and 14, 1919.

(Continued from page 1006.)

THURSDAY—*Evening Session.*

Public Oral Hygiene Meeting.

The evening session was held in the auditorium of Mizpah Inn, and was devoted to Oral Hygiene.

The meeting was called to order at 8.15, Thursday evening, June 12th, by the president, Dr. Beach.

The PRESIDENT. It is unnecessary for me to introduce to any Syracusan our presiding officer this evening; but to our friends who are visiting I will say he is one of our leading men in Syracuse. He is always backing up enterprises which are philanthropic and have to do with the uplift of the community and which serve the public. He is a man who has done a great deal for Syracuse, and in going over the list of public men whom we might ask to preside at this session, we could think of none more appropriate than Mr. Donald Dey, who will now take charge of this meeting.

Mr. DONALD DEY, Syracuse. *Mr. Chairman, ladies and gentlemen,*—I am not quite sure why I am here. Your president has been very complimentary to me, and of course after I was invited I thought it was my duty to do at least my part. Apparently my share of the work is going to be very light. A state organization, with the capacity for doing good that this dental association has, is certainly one of the essentials of this state. It has a wonderful work to perform—in fact, I have reason to believe that the dentist works in a fearful and

wonderful way! I made the acquaintance of a dentist a few years ago, and really I am not quite sure that I have forgotten it yet. Recently, in my own household, one of the members had occasion to go to a dentist. The work done was very speedy and very nice, and it did not hurt at all. It shows the advance that has been made.

I have reason to think these scientific artists who are here from all over the state have a little notion of business as well as of the fine arts and the appropriateness of things. Although this company of men are not as good advertisers as I am, I am sure they do advertise in a way. Some of the Syracuse people know of the specialties we have. Some of you know me as "D.D.," but tonight I may be considered a "D.D.S." which accounts for my being on the platform.

I will not be flippant any further, but introduce some of the speakers. I am glad to welcome you, and hope you will come soon again. You have chosen a most beautiful section of the State of New York, and a good time to come here. Why not come again? If our mayor were at home, I have no doubt he would receive you with open arms and give you an official welcome.

I am very happy to announce the first speaker. He will deal with the subject of the relation of the dental condition with the physical, moral, and mental development of the children. I present to you Dr. T. P. Hyatt, of New York.

Dr. T. P. HYATT, New York City. *My Friends,*—In addressing people upon a subject that I feel is so vitally impor-

tant to the welfare of humanity, and particularly to those little gifts from heaven, our children, I always regret that the seating capacity of a building like this is not fully occupied, that every seat is not taken, because I feel with great sincerity and earnestness that the subject I am to speak upon this evening deserves the attention of a large audience and a far better speaker than myself. I would that we could secure a man with gifted eloquence, with logic and force and the power to present to you, not any big imagination of the dental profession, but the actual facts, to which the majority of mankind have not yet awakened, not yet realized; because, if they did realize the truth as it is, unvarnished and unpainted, I know full well the citizens of this city would at once register their desire and their intention that dental care and dental attention should be given to every child that comes to earth. I pray for nothing greater than the ability to express the truth as I see it and as I believe it, and I ask your kind indulgence to overlook the shortcomings of my inability to present the subject to you in the fulness that I have it in my heart and mind, and to realize that to be more true than I can express it. Only my inability to convey it prevents its full significance being borne to your mind and to your heart.

The speaker who so kindly introduced me made the remark, "Why should we not come again?" There could be no more delightful compliment to the gentlemen who are to address you this evening, than to know that they had been able to put the truth "over the top" in such a way that you who are here tonight would demand that they shall come here again, and that you yourselves will be the hosts to invite your friends and educators and men related to the public welfare to the meeting, and this whole building should be filled with people interested in the welfare of the children of your city.

I hope I will not be accused of any desire to exaggerate when I tell you there is no one subject today so important to the spiritual, the moral, the intellectual

and the physical development of the race in your town as this question of oral hygiene. I believe I state the truth when I say this, and there can be no exception to truth.

I propose to show you a few slides. I have been asked to confine my remarks to twenty minutes. Undoubtedly that was wisely done, because the president of the State Society realized that twenty minutes was the limit of my capacity, but were I to speak according to my feelings, I could talk for many hours.

Do you realize that our life is dependent on three things—the air we breathe, the water we drink, and the food we eat? Take away any one, or any two, or all these three elements, and the human being cannot live. I should like you to fully appreciate the entire significance of that statement. The child needs air to live; the child needs liquid to drink; the child needs food to eat—and all of these pass through the mouth or are affected by the condition of the mouth before being taken into the digestive apparatus of the body to be digested and assimilated, to build up the growing body of the child. You know full well that vast sums of money are being spent each year in every town and city of every state of this Union so that the water conveyed to the population shall be as pure as it is humanly possibly to make it. You know vast sums are spent every year by our Government to inspect the food that it may be as pure as it is humanly possible to have it, before it is conveyed to the child. You know every good mother and housekeeper will take care that water and food are served or prepared in clean utensils before they are given to the child and taken into the mouth—the mixing chamber for the food and liquid before it is taken into the digestive apparatus to be changed into those forms necessary to build up the different parts of the human body.

Of all the millions of dollars that have been expended for that purpose, how much has been spent upon the mouth of the child—the mixing chamber, the recipient of this food and water? I shall show you a picture of the waterworks of

Greater New York. You will see the mighty work that has been done by man to convey pure water to the inhabitant. When you realize, as every conscientious dentist realizes, the appalling condition of the mouths of the children in Greater New York alone, and the physical impossibility of rectifying that condition by mere curative measures, you will realize that those men of my profession who have a little view into the future appreciate the tremendous importance of preventive measures, because we know that while it is not possible to absolutely prevent decay of the teeth, it is possible to reduce the number of decayed teeth by the teaching of oral hygiene, and that it will well repay every community and every city to take up this work in a conscientious and intelligent way.

Furthermore, we are learning—the medical profession as well as the dental profession—that the physical development of the child depends largely on the kind of food the child receives, just as this building depends upon the materials used in its construction. If they be good, the building will be strong; if they be poor, the building will be weak. Where the body is debilitated by improper nourishment, all its parts are rendered susceptible to disease—the teeth among them—so there is the relation of cause and effect. We know that through the lack of proper power to chew the food, there takes place a lack of development of the bony structure of the head. The average person does not realize the enormous amount of muscular power used in the mastication of food. The strongest muscles of our body are those that are used for the purpose of mastication, and the bones of the child are soft and pliable; and as these muscles are exercised in mastication, they pull on the bony structure of the skull and increase its size.

There have been experiments conducted with rabbits, where the teeth of one rabbit were destroyed on the right side, and the teeth of another rabbit destroyed on the left side, with a third rabbit left with the full denture as a control; and when the rabbits grew to

full size they were killed and their skulls examined. It was found that the skull of the rabbit was not developed as well on the side where the teeth were destroyed as on the side where the teeth were left intact.

We know from statistics that the effect upon the morality of the child is observable, and I think I shall be able to explain that with another illustration, where I show the close connection between the nerves that go to the teeth and supply them with sensation, and the nerves that go to the brain. Dr. Upson of Cleveland, Ohio, who had made a very close study of insomnia, melancholia, and insanity, with relation to the teeth, cited the case, before the First District Dental Society of New York City, of a child about fourteen years old who commenced to steal, and then denied he had done it, even when they found the goods upon him. Fortunately for the parents, they took the child to Dr. Upson, and he made a radiographic examination of the head, and found an abnormal condition. All of the molars that should have made their appearance at the sixth year lay horizontally in the mouth, and were, as we say in dentistry, impacted; so that they could not come into their proper places; and while that impaction did not produce pain in the mouth, it produced a reflex nerve irritation that affected the brain of this boy. When those teeth were removed and this nerve irritation was stopped the boy became quite normal. When he was about twenty years old he stole \$800 and a horse and buggy and ran away, but was captured by the police and was again brought to Dr. Upson. It was found that all the wisdom teeth had not erupted, and could not come through, as they were impacted and imbedded in the bony tissue of the jaw. When they were removed, this nerve irritation again stopped, and the boy became perfectly normal. This is an exceptional case, and I do not wish you to think that every thief has impacted molars; but I do want you to consider what brought about this condition in the boy.

Some few years ago, when the oral hygiene movement started around the

world, I received reports from Germany. We started the oral hygiene movement in the United States of America some eighteen or twenty years ago; but it was left to the Germans to put it into practice before we did, and I would like the people of the city of Syracuse to take notice of that. In their report after two years' work in compulsory dental treatment for every pupil in one of the schools, the most interesting information I derived was this: Those children who had received dental attention in the clinic, who had before been unruly and disobedient, were now obedient and orderly in their classes. I want every man and woman, and particularly the fathers and mothers, to understand that these children did not suffer any pain in their mouths; but the irritation of the dental nerves from that abnormal condition in the mouth was transmitted to the nerves controlling the mental powers of these children. These children became nervous and irritable, and they could not sit still. They wanted to do something—they were on edge, as though they would like to raise Sam Hill, or the dickens, or however you would characterize it—get into a scrap with somebody. I do not think any of us escape that sometimes—you feel as though you have a chip on your shoulder! These children suffered from reflex nerve irritation, and it expressed itself in the child moving around in its chair. The teacher tells the child to sit still, and when he does not he is punished and "kept in" after school. The child feels he has been unjustly treated. The adult should know that there was present a condition that required adjustment. I dislike to think of our responsibility toward the criminals that you and I are punishing for crimes that the Lord knows may not have been from any devilish instinct in the soul, but the result of abnormal bodily defects. The question of oral hygiene for the children is a moral as well as a practical one, and we should see to it that the children receive the fullest benefits from a well-established system of school dental clinics.

I am a member of one of the oral

hygiene committees in Greater New York. We were requested to make an examination of 2104 girls in one of the high schools there. The findings were recorded on specially prepared charts which saved much time. The physical director of the school and her assistants made a study of these records and made a report to us of considerable interest. They found that the best room average was 1.3 cavities per girl. The worst room average was 3.5 cavities per girl. (Every girl in this room was a "held back," or one who had failed to pass her last examination.) Do not go away with the idea that I believe that because these girls had some cavities in their teeth they could not pass their examination. Not at all; but those who are careless with the hygienic condition or cleansing of the mouth are more than apt to be careless with their appearance, their rooms, and their studies; in other words, they are generally careless in all they do. Those who are careful of their personality and their appearance are likely to be careful of their studies and their dress and everything else.

The cost of educating a child in your city must be the same as in other parts of the state. Dr. A. C. Fones, of Bridgeport, had much difficulty in starting dental work in the schools, but finally succeeded in securing an appropriation, a small one, but something to start with. Dr. Fones and some of his dental friends established dental clinics for prophylactic purposes, teaching the children how to properly use the toothbrush and also giving illustrated talks.

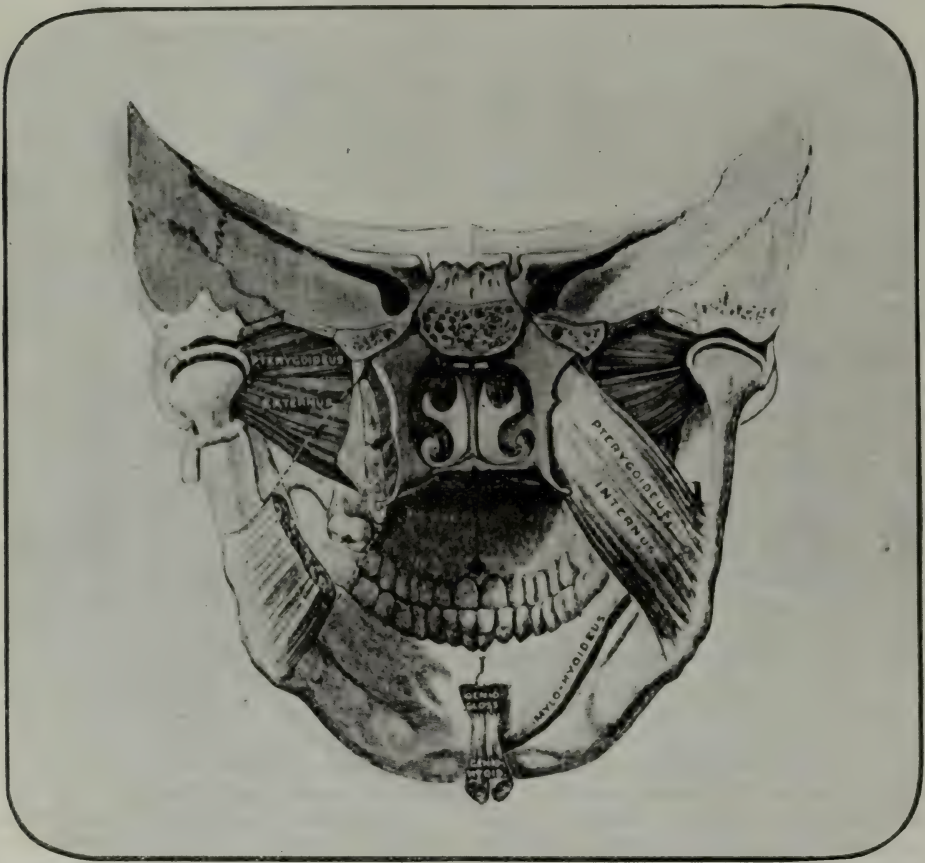
In previous years, 40 per cent. of the amount of the budget for educational purposes in Bridgeport was used for the re-education of children. After five years of dental work and teaching the children how to care for their mouths, only 17 per cent. of the budget was used for the re-education of the children. As the cost for educating one child for one year in New York City is something like \$30, you can realize what a tremendous saving it will be to the taxpayers when the authorities awake to an appreciation of the value of mouth hygiene.

It is a great advantage to have dental hygienists—young women educated to teach the children the care of their teeth, and who give prophylactic treatments to the child. The question of health has been tremendously enhanced in Bridgeport by the teaching of oral hygiene.

soft bones of the child's skull and tends to enlarge them.

Fig. 2 shows the strong muscles on the outside of the jaw, attached to the temporal bones. These muscles are powerful, and if you wish to try an experiment that will bring it graphically before

FIG. 1.



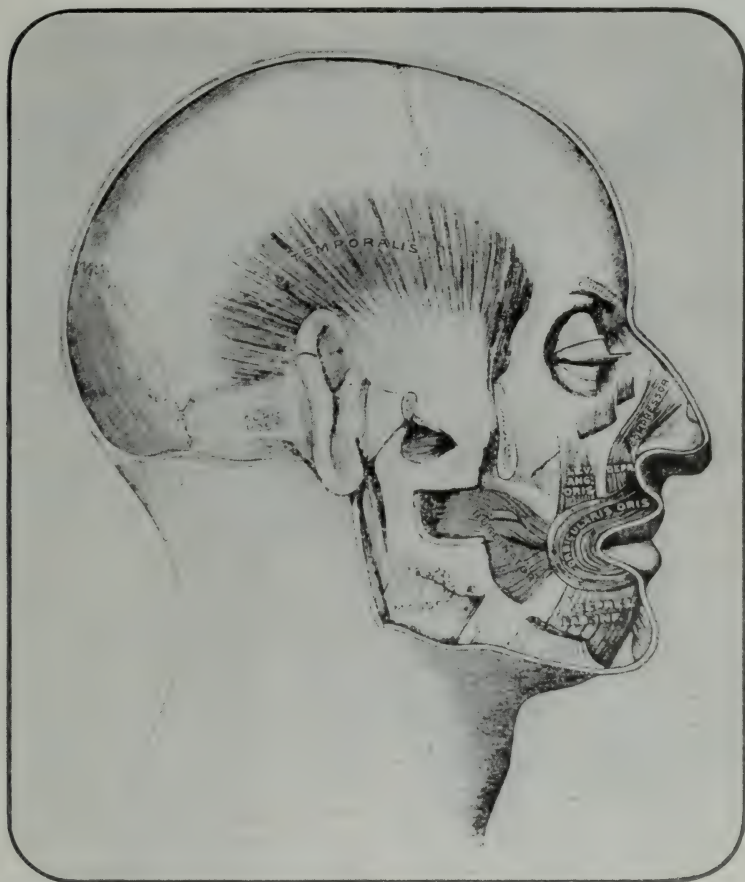
This slide (Fig. 1) illustrates the powerful muscles used in the mastication of the food. They move the jaw from right to left and forward and backward, in the chewing of food. These muscles are attached to bones at the base of the skull. Muscular activity takes place by the contraction of the muscles, drawing the ends closer together. The contraction of these muscles draws upon the

you, take a piece of stale bread, two or three days old, and attempt to crush it between your fingers. You cannot do it, but put it in your mouth, and see how easily your jaws will crush it. This will give you some idea of the power of these muscles that I show you here. You can then realize the importance of the use of the jaw to the child in its mental development.

These muscles exercise a great pull upon the bony structure of the head and thus enable the larger growth. You will recall my telling you about the rabbits. Those that had the teeth removed on the right side were found to have a lack of development of the bony structure of the skull on that side, while those that had

that portion of the teeth not seen in ordinary clinical examination. I have told you about the physical development depending upon the food, and also the mental development; but the health of the human being also depends largely on the condition of that portion of the teeth hidden under the gums.

FIG. 2.



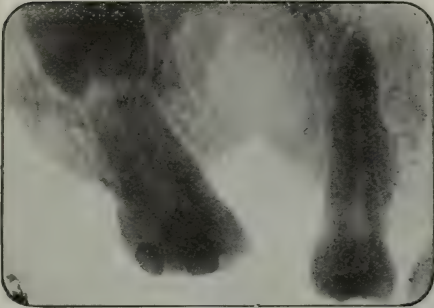
the teeth removed upon the left side had their skulls under-developed upon that side. As the brain can be no larger than the bony box that contains it, any lack of development through inability to properly use these muscles must cause a lack of growth of brain tissue and loss of mental development.

An X-ray picture will demonstrate

Fig. 3 shows you a third molar unable to come into its proper place. It was impacted there. The young man had a beautiful set of teeth and the mouth was perfectly clean. For four years he had been suffering from boils. He had been to a number of physicians, and to the Health department of New York. They had not succeeded in helping him.

A radiograph was made and there was found a third molar impacted upon the roots of the second molar. When the second molar was removed a culture was carefully taken from the crown of the

FIG. 3.



impacted tooth and bacteria found. After this was cleaned up and the tissue healed, the boils left.

Fig. 4 shows another case of what is known in dental literature as an abscessed condition—a blind abscess—one that does not discharge into the mouth,

FIG. 4.

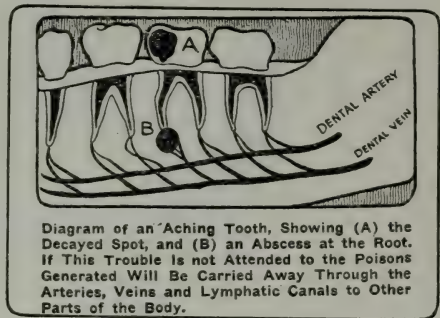


one of which the patient is quite unconscious. These as a rule do not cause any physical disturbance in the mouth. Statistics have been gathered from 2000 cases, divided into two classes—class A, 1000 patients having no dental infection showing at ends of roots of teeth, and class B, 1000 patients showing dental infection. It has been found that there

is an increase of 118 per cent. of neuralgia in class B as compared with class A; an increase of 78 per cent. of carbuncles and boils, an increase of 84 per cent. of skin troubles, 19 per cent. of headaches, 164 per cent. of nervous troubles—all among patients in class B as compared with class A.

I believe that at least 80 per cent. of these cases could have been prevented by the early education of the children in how to take care of their own mouths and by giving them proper prophylactic treatments. You cannot polish your own teeth very well—the dental hygienist takes care of that, and it is much easier

FIG. 5.



to take care of the teeth after they are polished.

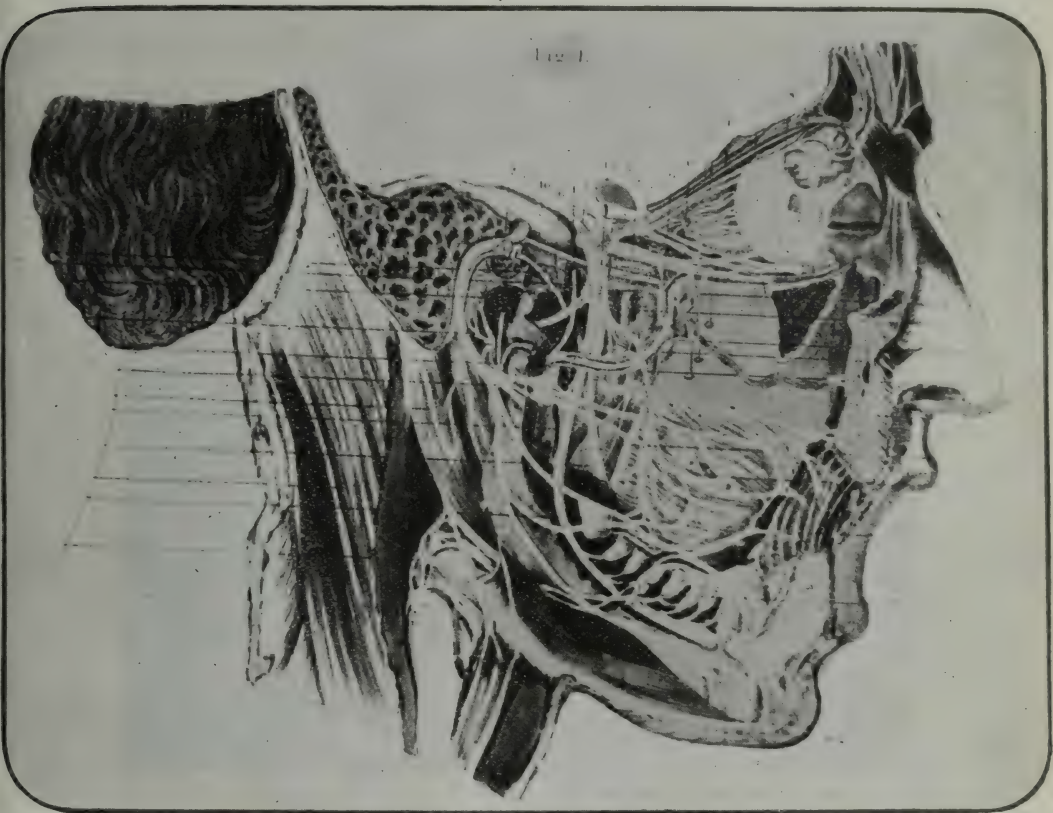
Fig. 5 illustrates what happens in the case of the blind abscess. The poison is carried into the circulatory system, or the lymphatic system, and there is also caused an irritation through the fine nerves that ramify to all parts of the body, particularly around the teeth. The nerve irritation plays its part, and I have no doubt that the germs carried into the blood have their effect, and those that are carried into the lymphatic system have their effect. Did you ever stop to think that every sound tooth in your head is a living organ? If you cut far enough, you will get blood. You must keep up the power of resistance, and when the mouth is taken care of by the dental hygienist and you take care of it at home, you maintain the highest power

of resistance in keeping these teeth from breaking down. You can never keep the mouth perfectly free from germs, but if you can keep the teeth perfectly polished and clean, it is doubtful if they will decay.

Fig. 6 shows the nerve supply to the teeth. These dental nerves are branches

on the buccal side and slightly under the gum was found a cavity. When this was treated and filled, all pain ceased. Now let us follow this. Here is the tooth with the cavity. The irritation at the ends of the nerve were reflected along the nerves through the root of the tooth until they reach the nerve branch. Then they

FIG. 6.



from a central ganglion. You will notice that some of the branches go off to the eyes, others to the ears. By the aid of this illustration I shall be able, I think, to explain to you reflex nerve irritation. A patient had pain in one of the front upper teeth. An examination did not reveal any cavities or any other local conditions which might cause pain or trouble. A careful examination, however, was made of all the other teeth, and

were switched off in this direction [indicating]. Now, why they went in this direction and not that, I do not know, and as yet no one knows. In this case the irritation was switched forward and this tooth manifested the pain. In some cases the irritation will be reflected all the way back to the ganglion, and from there switched to the nerves going to the eyes. In such cases there will be eye troubles. There are many records of eye

troubles having been cured by treating the teeth. The same with ear troubles. Notice how close the ganglion is to the brain. Small wonder, then, if the dental irritation when reaching the ganglion should be switched to the brain, that impulses arise both immoral and irrational! Dr. Cotton of New Jersey has shown that some cases of insanity have

around New York City. When I was asked why I desired this permission, I told them, to secure data to show that there should be army dentists as well as army physicians. I was asked to make this request in writing. In the course of three or four weeks I received the official reply from the Surgeon-general's office: "The request of Dr. Hyatt

FIG. 7.



Dental Inspection of Soldiers in the U. S. Army.

their origin in dental conditions. You can now better appreciate how it is possible through reflex nerve irritation to have paralysis, neuralgia and other troubles originating from or caused by dental conditions.

Fig. 7 shows the importance the United States Government has attached to dental conditions. Twenty-two years ago I went to Washington and asked for permission to make an examination of the teeth of the soldiers stationed in and

is not granted, because, while it is desirable for soldiers to have good teeth, it is not necessary; and furthermore, inasmuch as it has never been done before, it is not desired to establish a precedent."

The dental service rendered the boys on the other side has, I think, done much to bring many of them back to their homes and their loved ones. I met a captain yesterday who told me that the dental care given the men under him enabled them to "carry on," whereas in

another group of men with whom there was not a dentist, many of them fell by the wayside. The stress and strain caused by the life they were leading developed the weak spots, and where there were pulpless teeth with root infection they quickly developed active pathological conditions.

Fig. 8 is an advertisement calling attention to an article published in the *Ladies' World* in regard to pure food.

Philanthropic societies of New York have been providing pure food, cooked in clean utensils, for the poor children, so they might have food to sustain them

FIG. 8.

Is Your Food Clean?

It's a very pertinent -- almost
impertinent question to ask.

Is Your Food Clean?

But it is something every house-
wife should ask herself. It is
important.

ANNA STEESE RICHARDSON
shows how important it is
in the October number of

The Ladies' World

News-stands Everywhere -- Ten Cents

in their work. (See Fig. 9.) These little bodies have to grow, and their mentality has to grow—every part of them has to grow. The water and the food has to go into the mouth, and has to be mixed there, and therefore the condition of the mouth will have much to do with the condition of the food before it is taken into the stomach. Dr. Goadby of England, speaking before a body of surgeons and telling them what they must do to have perfect success after major surgical operations, spoke to them as follows: "You must examine the mouths of your patients. You would not allow your patients to apply their lips to a running ulcer on the arm, and swallow the pus, yet you know that broken-down bone

tissue is more poisonous and irritating to the digestive organs than the matter that comes from a running ulcer. Then how can you allow them to retain a broken-down tooth in the mouth, when they are swallowing this matter all the time?"

If this is true in regard to patients who have passed through a major surgical operation, how much more true must it be when applied to young, growing children. The work of conserving the health of the children is not finished by Government and municipal inspection of foods and water, but must be carried on to the mouth of the child, and provision must be made to provide the necessary means to accomplish this.

Fig. 10 shows a type of mouth which is far more numerous than you realize, unless you, like myself, have looked into the mouths of some of our children in the public schools. The sum of \$177,000,000 was spent by New York City for the purity of its water, but almost nothing has been spent for the little children to safeguard their health by proper care of the mouth. When will you realize this, and realizing it make demands as taxpayers and as parents that our public schools shall care for our children sanely, logically, and economically? Why should we spend so much upon education when one-third of it is thrown away upon little bodies not physically qualified to retain it? A sound mind needs a sound body.

Mr. DEY. Already I have come to the conclusion that the mouth is also wonderfully and fearfully made. These distinguished gentlemen who will address you have come here very largely for your benefit. They are promoting work of great value to us.

I present to you Dr. A. H. Stevenson of New York, who will tell us of practical methods being used for the benefit of the children.

Dr. A. H. STEVENSON. I have a letter here that I would like to read to you, which I would call "A Parent's Protest." As there are so many teachers in the room, I think they will appreciate this letter, which was received by a school

principal from the parent of one of the children. There had been activity in the school in the direction of oral hy-

brushes her teeth; and you have taught her to be stingy, too, because she will not lend her toothbrush to her sister.

FIG. 9.



giene, and the children had been taught most assiduously how to clean their teeth. The letter reads:

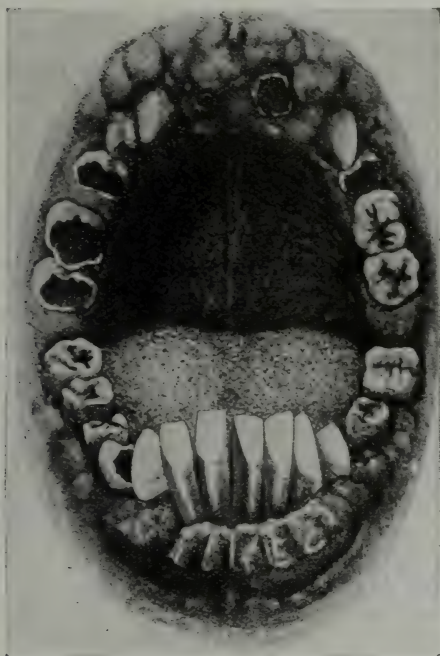
Dear Mam,—Susie goes to school to learn, but you teach her to brush her teeth, and she does not study any more, but always

That is an actual letter that was received in New York, and I read it because I know some of you believe we may overdo these things in our enthusiasm.

This is a great day for efficiency in everything. The business men here to-

night realize the full value of that word. They are doing everything they can every day to produce efficiency. Educators know it, and the dentists know it. If this big project is worth anything at all, it is deserving of up-to-date methods, and we should apply efficiency to it most certainly. How? Very briefly I shall try to show you how. We have learned a good deal about efficiency by this terrible devastating war we have just passed

FIG. 10.



through, and one of the things has been the effort to correct dental defects.

The greatest physical defect we have to cope with is the dental defect. No one will take issue with me on that. I have just learned something rather startling right here in Syracuse. You have approximately a population of 160,000, and about 120 dentists—meaning if every dentist in Syracuse started tomorrow and gave his services to this municipality, and worked gratuitously, taking the people as they came to him, each one would have about 1400 or 1500 people

to take care of, which, as the dentists will appreciate, would be impossible. Some of the people would be people who cared for their mouths and had their mouths cared for before; and others in Syracuse, as elsewhere, would be a portion of the population that had not cared for their mouths and had nothing done for them. You will see that, with all good-will, the dentists absolutely could not solve the problem. Where is the solution? It is the same as with big medical problems, with regard to certain diseases. They were not solved by the cures, but by sanitation and prevention. Give this thought, and carry away a new form of sanitation—mouth sanitation. This is how we teach it to the kiddies.

That is a toothbrush drill [illustrating], as the children are taught in the schools. In the teaching of children they take to it intuitively, as anything else they learn by cadence or by numbers. They go home and do it that way.

In New York City we had contests in the parks, and the local dental societies presented banners to the children who excelled. It was called "Dental field-day," and each group, representing the champions of that school, competed according to certain degrees of merit before judges. The girls won. They took the banner home, as proud of it as anything they could win. Rivalry is a wonderful incentive to get children to do these things.

Here is another group of children who are doing the same thing. In a mining camp in Colorado we see a little group of children who are being taught to keep their teeth clean, under the supervision of the Colorado Fuel and Iron Company. Why do they do that? Because the company is charitable? Yes; but efficiency in the worker and the worker's children means efficiency in the entire community as a whole.

The word "hygienist" has been mentioned tonight. When it was realized that the dentists could not cope with the situation, there were legalized young women with the proper qualifications, who had a course of training of a couple

of years, and knew how to clean the surfaces of the teeth. These young women take to these things very readily, and the solution of our problem is in a great measure in their hands.

This is the first group of hygienists graduated from the Forsyth Infirmary at Boston [illustrating]. Look at the faces of these young women, and you will see they are of a cultured and refined type. They consider it a calling, and an honored calling.

It appears to me you have not quite the problem here that we have in New York, with our 900,000 children. Multiply that by seven cavities average to each child, and see what the result would be. We have not yet had that grand man come forth who, like Mr. Forsyth or Mr. Eastman, who endowed the Rochester Institute, will endow an institution in New York, although we need it sorely. We hope in the near future to have it. In Syracuse you do not need such a big endowment. It is surprising what a little money will do. An initial gift of \$5000 for maintenance will fill 8000 incipient cavities and clean 3600 children's mouths, in these days of high cost of living. Where could \$10,000 buy as much as is represented by that statement? Where can 86 cents per child give greater happiness, or do greater good, and have a greater moral effect? That is something to think over.

Syracuse cannot afford to be without school clinics. I wish the department of education and the mayor were here on the platform; I think I could give them the idea. You must have about 1000 children per term who fail of promotion—are delinquent in some way. It costs about \$22 per term to educate each child—\$22,000 to educate for one term those 1000 children, a big proportion of whom fail of promotion because of dental defects. I repeat, Syracuse cannot afford to be without school dental clinics, viewing it from the purely economic basis. As a further argument, let me add that the big industrial corporations, one by one, are finding out that a certain amount of money spent each year in caring for the mouths of their

employees brings tremendous returns in efficiency.

Dr. Burkhart has something to show you of what is being done in Rochester; we are struggling in New York with a small group of girls. It remains, after all, not with the rich man, or the mayor, or the board of estimate to bring about the desired result—it rests with each citizen who is interested in the school child. When the need is brought forcibly to them, politics, conservation of funds—nothing, will stand in the way. Let us see in a year from now that Syracuse has really started something. One of the few evenings that these gentlemen from New York take from their practice has been given for you. What are you going to do with it? Get together with your philanthropists and your board of estimate, and let us hear the result.

MR. DEY. The state has become seriously interested in this matter, and in its judgment has thought it wise to supervise the work in the schools. From Albany comes a man clothed with authority, who will speak to us on the subject. Dr. W. H. Leak will speak to us on "Oral Hygiene in Public Instruction throughout the State."

Dr. W. H. LEAK, State School Dental Inspector, Albany. I entered the practice of dentistry in Watertown, and in those first days of practice I found I had no great rush of business. So I took one day a week to go to Harrisville, in the Adirondacks, and do some work there. I had some interesting and amusing experiences there. One day, on returning from Harrisville, I noticed the railroad company apparently training a new man, for as the man who was usually on the train opened the front door and called out the name of the station, a man at the rear door called the same name. "Lake Bonaparte," said the man in the front, and the man in the rear said "Lake Bonaparte." The old man said "Natural Bridge," and the new man, "Natural Bridge." The old man continued "Carthage; change cars for Philadelphia, Clayton, Gouverneur, DeKalb, Ogdensburg, Canton, Potsdam, Norwood, and Messina Springs. This train

for Watertown, Cape Vincent, Sackett's Harbor, Adams, Richland, Oswego, Syracuse, Rochester, Buffalo, and the West." The new man in training at the rear said, "Same at this end!" I am sure I feel, after having listened to the very interesting and instructive addresses of Drs. Hyatt and Stevenson, like saying—as the new train man said—"Same at this end!"

Dr. Hyatt has shown that many deformities and diseases are caused in the adult from dead teeth and pyorrheal conditions. While we are hearing a great deal about that, all of which is true, we must not forget that simple decay of the tooth causes a great deal of physical deterioration and leads to bad systemic conditions. The simple decay of the teeth, the loss of the masticating surfaces, the inability of the person to masticate the food, produces indigestion and malnutrition; with that malnutrition we get a broken-down resistance, and the person becomes more susceptible to those disease germs which are most abundant in the mouth.

Things appear larger to the child mentally than to the adult. When the child sees a number of cattle or sheep in the field, he says: "There are a thousand sheep." When as a child you saw a certain house, it seemed very large; but today it does not look so large to you. As the physician must use care in administering a dose of a medicament to a child, so we also must use care with the child.

I believe a great many of the glandular troubles we see in children are the direct cause of focal infection. As the adult is affected by malnutrition from improper mastication of food, so also is the child, and perhaps more so. We have anemic children with their bodily resistance lowered, and they become susceptible to the disease germs which produce children's diseases, whooping-cough, scarlet fever, measles, and diphtheria. There is a definite reason why children between five and fifteen years are susceptible to those diseases. Children between those ages are the ones who have the worst and most serious mouth condi-

tions, and I believe if the mouths of these children were put into proper condition, we should reduce these so-called diseases at least 50 per cent.

You have possibly heard it stated that 90 per cent. of our children have decayed teeth. I am going to put it more strongly than that, and say 90 per cent. of the school children in the first grades—not only in the slums, but in the aristocratic and best sections of our cities, have bad teeth; one-third of them have abscessed conditions in their mouths, and every fourth or fifth child does not have proper masticating surface. Of these little tots in the first grade, seven years of age, 40 per cent. have the sixth-year molar decayed—a tooth which they have not had in the mouth more than a year; and yet that first molar of the permanent set is decayed and allowed to go on without proper attention!

When I think of these serious mouth conditions of the child, I cannot help but be impressed with the fact that the neglected mouth conditions of the child today are the greatest blight upon American civilization. There is nothing that causes more physical deterioration—not even the mal-use of alcohol—as bad mouth conditions, and although the American public has not yet awakened to the seriousness of the situation, I feel they will do so.

We are indebted to the Greeks and Romans of old for many of our greatest works in literature and art. In the school of that day the child was required to spend one-half the time in mental development and the other half in physical training, and that led to the attainment of health. We turn to those same Greeks and Romans for our examples of beauty of form and grace of body.

Medical science has shown us that we are living among many conditions which are improper, but which may be corrected. We know there are many adults suffering from diseased conditions, which if they had been attended to in childhood might have been corrected or perhaps prevented. We know we have in our public schools many retarded school children who have become discouraged

because they have become retarded, and they leave school. Many of them are retarded on account of physical conditions and disease conditions which might have been corrected or perhaps prevented—many of them of dental origin.

It is an important and necessary obligation that we owe to the people of the country, to educate them to the seriousness of this subject, that they may adopt some method of correcting these conditions. And the best place to begin that education is with the child; the best and most efficient place is in the school system of our country.

The New York State department of Education has a definite plan in view, just starting in operation, a plan of what will be probably known as "public health education." There are many questions to be considered, and we have a big problem on our hands. One problem is the question of time. Another question with which we must deal is the question of finance.

In taking up this subject of health education we must necessarily give dental health education a very important part, because of its very definite and positive relation to the entire body. We are not going to do this in a spasmodic way, by having dentists occasionally go to schools and give lectures, and perhaps come back in three months, or six months, or a year, and give other lectures; we want to undertake it in a systematic manner. We must start with the school teachers and give them the necessary education in dental health, so they may impart that knowledge to the children. It has been my privilege to go to each of the normal training schools of the state, and to impart to them some of this knowledge. The child will take up this subject at stated periods, and will be required to pass an examination in dental health, and to secure an average of 75 per cent. The child will be required also to pass an examination on the condition of its own mouth and secure an average of 75 per cent. I learn that two of the high schools of New York City today are requiring that their students shall have good mouth condi-

tions as one of the requirements for graduation.

We will interweave the subject of dental health with the other studies. In spelling we will introduce the dental nomenclature. In reading we will have them read dental literature. In arithmetic we can tell them the amount of stress required to masticate certain amounts of food. In zoölogy and biology we can show the different dental equipments of various animals, and how they are arranged to take care of the peculiar foods of that section of country, and how the habits of the animals are controlled thereby.

We have been establishing dental dispensaries in many of our towns and cities, and it was my pleasure last week to assist in inaugurating the first rural dispensary, in Nassau county, under the auspices of the Junior Red Cross, and they are going to do that work by automobile.

What we have done is entirely inadequate. We have in Rochester, one of our large cities, very adequate dental equipment, but I want to call your attention also to the little town of Chazy, which is situated four or five miles north of Lake Champlain. They have only 500 school children, but they have the best dental equipment that can be secured, and they have a dentist at full time to take care of them. We have a few wonderfully good examples in the small communities, and one large one at Rochester, but we must have them in other cities!

I believe the citizens of Syracuse are very proud of their community. They want to make Syracuse one of the best places in which to live, and it cannot be done by only building beautiful structures and beautiful parks, but you must also take care of the health of your citizens, and that can best be done by taking care of the teeth of your children.

American dentistry has led the world, and when I speak of Flagg, Hayden, Harris, Wells, Evans, and Miller, I speak of men who have accomplished as much as it has been the privilege of any man to accomplish. American dentists today serve the best people of all the foreign

lands. Foreign dentists come to America to complete and better their dental education. The American soldier was the best soldier on the field, partly because he had the best cared-for teeth. Let us take a new and grander lead in oral hygiene, and set a pace for the rest of the world, in a very efficient plan of education for the school child, and let us establish efficient dental dispensaries all over the state.

Mr. DEY. We learn from Albany that Syracuse is doing something, and we are ready to believe Rochester is doing a great deal. My friend who is about to address you is a skilful man in his profession, and also has had a hand in affairs of state. I present to you Dr. H. J. BURKHART, who will tell you what is actually being done in Rochester.

Dr. H. J. BURKHART, Rochester Dental Infirmary, Rochester, N. Y. It is very pleasant indeed for me to be introduced by my friend, Donald Dey, whom I have met on other battlefields.

About three and a half years ago, Mr. Eastman of Rochester offered to endow the dental dispensary of Rochester with \$750,000 to pay the running expenses of that institution, and in addition to erect a building, which has cost up to this time, with the equipment, approximately \$500,000. In the deed of gift was a provision that at the expiration of five years the \$750,000 should be turned over to the institution if Mr. Eastman were satisfied that the institution was doing proper work. At the end of three and a half years he became satisfied that the work was satisfactory, and gave \$750,000 to the treasurer—and for good measure \$250,000 more.

The work of the Rochester Dental Dispensary is divided into two parts—the work done in the dispensary proper, which consists of the ordinary filling of teeth, orthodontia work, and extractions, and the surgical part—for the removal of tonsils and adenoids, and the oper-

ation of cleft palate and hare-lip. We will not do any surgical operations until all carious cavities have been filled, and the teeth placed in a proper condition.

The other part is the prophylactic work, for which the City of Rochester makes an appropriation of \$30,000 each year. The work is done by squads of licensed dentists and dental hygienists. This work is done in the public schools, the parochial schools, and orphan asylums. Each has been visited twice during the last year, and approximately the mouths of 40,000 children have been cleaned twice, at an expense of about 27 cents per mouth each, which is somewhat in contrast to the figures which Dr. Stevenson gave you; but things cost more in New York, I suppose, than up-state.

Since the organization of the dispensary something over 9000 children have received treatment, and there have been about 90,000 visits to the institution, and it has cost 21 cents for each visit, for the filling and the other dental work that has been done. There is also in connection with the institution a school for dental hygienists, to which reference has been made.

It is conducted primarily for the purpose of educating hygienists for use in the public schools of Rochester, but the dental profession has come to realize that a dental hygienist is very necessary; so the schools of Rochester have been obliged to help out the dental profession, and we only have, out of the three graduating classes of about 110, fifteen or sixteen whose services are available in the schools.

[Dr. Burkhardt showed a large number of slides showing the exterior and interior of the building, the arrangement of the clinics and chairs, the various modes of receiving, treating, and dismissing the children, etc.]

Adjourned.

(To be continued.)

Campaign to Enlist the Co-operation of the Dental Profession in the Fight Against Venereal Diseases

BY THE

Bureau of the Public Health Service, Washington.

[Introductory.]

FROM THE OFFICE OF THE SURGEON-GENERAL.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—The great war just ended disclosed to an astonished American people that the extensive prevalence of venereal diseases among the men drafted for military service had its source and inception principally in an infected civilian population.

To combat these diseases, Congress, when made aware of its extent and its alarming depredations into the health of the civilian population of the United States, passed the Chamberlain-Kahn Act, charging the Public Health service with the definite responsibility of organizing an effective campaign for the control of venereal diseases.

Accordingly, through its division of Venereal Diseases, the Public Health service outlined a plan whereby it would co-operate with state Health authorities in effective venereal disease control. This provided for the appointment of an officer of each state to co-operate with the state Health officer in directing the work of venereal disease control. The plan of procedure formulated was grouped under three headings, as follows:

- (1) Educational measures;
- (2) Medical measures;
- (3) Law-enforcement measures.

The *educational* measures include the dissemination of information by leaflets, lectures, exhibits, moving pictures, stereopticon views, and other means, among industrial plants, commercial institutions, schools, churches, clubs, libraries, community centers, the home, and every walk of life.

The *law-enforcement* measures include encouragement of the closing of restricted districts; stimulating enforcement by state and municipal officials of laws and ordinances directed against prostitution in all its phases; the establishment and management of insti-

tutions for the rehabilitation of venereally infected feeble-minded persons; urging the adoption and enforcement of laws and ordinances compelling the reporting of the venereal diseases, the prohibiting of quack advertising, and the sale of venereal disease nostrums; and other measures designed to prevent the spread of venereal diseases.

The *medical* measures include the establishment of clinics; securing hospital facilities for venereally infected persons; making available laboratory facilities for the scientific diagnosis of venereal diseases; securing wide distribution of arsphenamin or similar products; obtaining the support of the entire medical profession by the reporting of their cases to the state boards of health, and the treating of venereally infected persons in accordance with the best modern methods; securing the co-operation of druggists in refusing to dispense venereal nostrums and directing prospective purchasers of such remedies to venereal disease clinics or reputable physicians; securing the co-operation of dentists and nurses in their respective fields of practice, and enlisting the interest and services of all medical, dental, and pharmaceutical schools, societies, and journals.

Under medical measures the campaign was begun with the advertising media of the country. With the end of the fiscal year June 30, 1919, out of 20,000 newspapers and magazines in the United States carrying advertising, approximately 140 only, or less than 1 per cent., were still carrying obnoxious advertising. In other words, more than 99 per cent. are co-operating.

The next step was directed to the druggists of the country. Out of the 48,500 appealed to, the results at the end of the fiscal year showed that approximately 28,000, or nearly 60 per cent., were co-operating, and since the

transfer of that campaign to state boards that number is now considerably augmented.

After the druggists, the 131,780 legally qualified physicians in the United States were appealed to, with the result that at the end of the fiscal year approximately 60,000, or nearly 50 per cent., of the medical practitioners of the country are co-operating. With the transfer of that campaign to the state boards of health this number is now also greatly increased.

Following the physicians, the campaign with the medical, dental, and pharmaceutical schools for more advanced didactic and clinical teaching of the venereal diseases was undertaken, with the result that not a school in the United States has recorded an objection or entered a dissenting voice.

The campaign with the 45,000 dentists of the United States is now being launched. Before starting this campaign the Surgeon-general invited the dentists of Washington, D. C., to a convocation held under the auspices of the National Capital Dental Society of the District of Columbia. A report of that conference is presented herewith. (See p. 1136.)

Following this meeting, a committee of

distinguished dentists, in collaboration with the Public Health service, formulated for the campaign with the dental profession a letter, an agreement card, and an appeal, similar to those used in the campaign with physicians, druggists, and advertising media.

The campaign with the dentists, therefore, consists of

(1) An "appeal" setting out every dentist's responsibility to the public health.

(2) A "letter to the dentists of the United States" explaining the campaign.

(3) An "agreement card" which every dentist is asked to sign and return.

Copies of these are presented herewith.

In order to bring this campaign to the attention of the dentists assembled at the annual convention of the National Dental Association at New Orleans and the dental profession of the country, you are respectfully requested to publish this letter, with the four inclosures, in your magazine.

Respectfully,

RUPERT BLUE,

Surgeon-general.

WASHINGTON, D. C., September 15, 1919.

[Appeal.]

AN APPEAL TO DENTISTS FOR CO-OPERATION IN THE FIGHT AGAINST VENEREAL DISEASES, FROM THE UNITED STATES PUBLIC HEALTH SERVICE.

THE war turned the spotlight on many things heretofore neglected or avoided. No disclosures were more startling than those showing the destructive inroads of venereal disease on the health and efficiency of the army and navy. From the time the United States entered the war in April 1917, to September 1918, the loss to the army from venereal disease represented 2,295,000 days of service.

Now the war is over! The nation is on its way to a peace basis. Interest begins to turn from the fighting efficiency of the army to the reconstructive power of industry; and as it turns,

this striking fact stands out: *All venereal diseases in the army were caused by conditions in civilian life. The army and navy, as organizations, do not tolerate prostitution.*

TESTIMONY OF THE ARMY.

Immediately following the declaration of war the Army Medical Department organized to cope with venereal disease, and one of the first points emphasized by its Surgeon-general was that each individual case must be treated under competent medical supervision until cured. He laid special emphasis on two points:

1. The ineffectiveness of self-treatment by the use of simple or patent remedies.

2. The danger of quack doctors, who advertise to treat so-called private diseases.

Nineteen months of war have shown conclusively the value of proper methods of treating venereal cases in the army.

MAINTAIN INDUSTRIAL EFFICIENCY.

For the protection of the fighting men as they return home, and to maintain maximum industrial efficiency, venereal disease among the civilian population must be kept under control. There is the same necessity for proper methods of treatment as existed in the service. *Self-treatment and quackery must go.*

RESPONSIBILITY OF DENTISTS.

Dentists must share the responsibility for preventing the spread of syphilis. It is found in all walks of life, all classes of society, and it is too often not recognized when examinations of the mouth are made for dental treatment. Persons who have lesions in the mouth and know they have syphilis, and admit it, do not as a rule seek the services of a dentist unless compelled to do so. Those who have lesions and are unaware of their condition present themselves to the dentist unsuspectingly, and for that reason are a serious menace to the health of the dentist and his *clientèle*.

The ease with which the disease is transmitted is well known to the members of the profession. A break in the skin or mucous membrane, a spirochete gaining entrance and passing into the circulation — and infection occurs. Syphilis is no respecter of persons; neither is it a respecter of tissues. The simple scaling of the teeth may, and usually does, involve a break in the continuity of gum tissue and exposes the

patient to any infection carried on an unclean instrument. In this connection the Surgeon-general, recognizing the extreme requirements of surgical cleanliness, and the difficulty with which the germ of syphilis is destroyed, recommends and urges that dentists continue to study and practice the principles of asepsis in all phases of their work. You are reminded that the saliva of those infected with syphilis is usually loaded with spirochetes, and that it is not necessary that blood be drawn from a patient in order to infect another through the application of instruments.

To recognize the various lesions found in the mouth which are signs of definite diseases requires clinical knowledge and experience. Many infectious diseases produce lesions in the mouth, and the study of these lesions, which might enable the dentist to recognize such infections, as well as the infection of syphilis, is extremely interesting and should be of material benefit to the dentist. It is believed that if the question of venereal diseases were discussed more freely and frequently in study clubs and dental societies, it would be a benefit to society and reflect credit on the dental profession.

Recent investigations have clearly proved that dental structures are an important part of the human economy. The man who treats his case symptomatically is most likely to fail. Dentists have been confronted with increased responsibility in the matter of general health, not merely because they have aspired to greater things, but because it has been thrust upon them, and the proposition must be met face to face.

CO-OPERATION OF PHYSICIANS, DRUGGISTS, AND ADVERTISING MEDIA.

The campaign now being carried on among dentists is similar to those carried on with physicians, druggists, and advertising media. It should interest

you to know that approximately 61,000, or nearly 50 per cent. of the physicians of the United States, and approximately 28,000, or nearly 60 per cent. of the druggists of the United States, have signed and returned agreement cards obligating themselves to co-operate; and in addition to these, more than 99 per cent. of all newspapers and periodicals in the United States carrying advertising have pledged themselves not to carry quack advertising.

WEIGH THESE QUESTIONS.

Will the dental profession accept its share of the burden which this work requires? On receipt of the inclosed franked card, properly signed, the Public Health service will ask your State Board of Health to supply you with additional scientific and miscellaneous literature.

RUPERT BLUE, *Surgeon-general*.
UNITED STATES PUBLIC HEALTH SERVICE.

[Letter to Dentists.]

[COPIES of the following communication, the attached card, and the appeal published above, will be sent to all dentists, with the request that the card be signed and mailed to the Bureau of Public Health Service.]

BUREAU OF THE PUBLIC HEALTH SERVICE,
WASHINGTON.

To the Dentists of the United States:

VENEREAL diseases are a serious menace to the health of the Nation. The United States Public Health service, in co-operation with the State Boards of Health, is making a vigorous campaign for their prevention and control, and desires your active co-operation.

The Public Health service recognizes the especial importance of interesting the dental profession, because venereal diseases, particularly syphilis, have been transferred to innocent persons through the medium of dental operations.

Furthermore, the public is fast awakening to the fact that the treatment rendered them by the dentist may have a direct bearing on the condition of their general health.

The accompanying bulletin outlines your responsibility in this important health work. Will you meet your responsibility and help your state board of health to win this battle against disease?

An agreement card is enclosed which please sign and mail today. No stamp is required.

Respectfully,

RUPERT BLUE, *Surgeon-general*.

[Card.]

DENTISTS.

**TREASURY DEPARTMENT
United States Public Health Service
DIVISION OF VENEREAL DISEASES.**

APPRECIATING the seriousness of venereal diseases among the civilian population, as indicated by the reports of the Surgeon-general of the Army, I hereby give assurance of my best efforts in co-operating with the United States Public Health Service and my State Board of Health to reduce the prevalence of venereal diseases, and specifically do I agree:

1. To report all venereal disease cases which come under my observation in my practice in accordance with the laws and Board of Health regulations of my State.
2. To advise treatment for all such venereal disease cases which come under my observation, referring them to a clinic or a physician known by me to be competent in the treatment of such cases.

(Name)

(Street)

Date:19...

(City and State)

**Convocation of Dentists by the Bureau of Public Health
Service**

UNDER THE AUSPICES OF THE

National Capital Dental Society of the District of Columbia.

At the regular meeting of the National Capital Dental Society of the District of Columbia, held in the dental school, George Washington University, at 8 o'clock Tuesday evening, April 1st, the United States Public Health service gave the exhibition of their film "Fit to Win," with the sequel, "Homeward Bound." Dr. Wm. H. Barnhard, president of the National Capital Dental Society, was in the chair. All ethical dentists of Washington were invited, whether members of the Dental Society or not. Ladies, and others interested in public welfare, were invited, and at-

tended generously. The large hall was packed, many being compelled to stand. Among the guests were many prominent persons.

The record of the meeting follows.

Dr. BARNHARD. We will dispense with the regular order of business so as to make way for the special feature of the evening—the film "Fit to Win," by the United States Public Health service. I consider the members of the dental profession of Washington especially fortunate in that we are the first dental organization in the United States before whom this educational entertainment

will be given. It will be given before every dental and other organization in this country, and I am sure there will be found no more appreciative audience than this one tonight.

The relation of systemic diseases to the mouth and the mouth to systemic diseases is beginning to be more fully understood and appreciated, not only by members of the medical and dental professions, but by the educated public as well. Practically every bacterial organism is found in the pathological mouth, conditions in the oral cavity being so ideal for bacterial incubation.

The mouth is the fountain-head or beginning of the great gastro-intestinal system. If the fountain-head is a cess-pool of filth and disease, what can be expected of the poor gastro-intestinal tract? And there is no other part of the body that has so important a bearing on systemic health. We have our pure food laws and carefully inspect food to see that it is pure and guaranteed, and then we instantly and most successfully poison it in the masticating process, and the gastro-intestinal system is affected, leading to a great, long train of ills too numerous to mention. There is another function of the mouth that has a very important bearing on the health; that is, its function as the masticating machine. Horace Fletcher, you know, is the man who carried the possibilities of the mouth in that direction to the limit, and did some very wonderful things, I understand. It might well be said with a variety of meanings that a man with his mouth may work his ruin or his well-being. As a means of diagnosis to the experienced eye, the mouth has a very important status. It is surprising how many troubles may be traced to it by careful examination of the mouth and its contents. It is not fortune-telling, either; it is real diagnosis.

All of these brief considerations bring us more fully to the realization of our important responsibilities concerning the health of our patients and of the community. We must live up to our responsibilities. The leaders in the edu-

cated classes have their eye on us to see how we come up to the mark. I am proud to say that the interest manifested by the large attendance this evening is indicative of the fact that we are alive to our responsibilities.

We surely are progressing. This is the age, the day, of prophylaxis. Tomorrow will be the day of right thinking. This will bring the right result, or the realization of the ideal for which we are all working, wherein the physician will become the metaphysician. We are beginning on the great epoch of prophylaxis. There is abundance of work; every man should put his shoulder to the wheel. Let us organize, combine our forces, and improve our understanding so that we may be more worthy of the degree we bear of teacher and healer. Our daily work brings us into the respect and confidence of our patients. Out of gratitude for this enviable status in their minds, we should surely feel called upon to give them of the best from our understanding of what is best. We shall improve our understanding this evening by that which we are about to hear and see. It gives me great pleasure to introduce the first speaker, a most estimable gentleman of the medical profession, and assistant surgeon-general of the U. S. Public Health service, Dr. C. C. Pierce.

Dr. C. C. PIERCE, Assistant Surgeon-general, U. S. Public Health service. *Dr. Barnhard, ladies and gentlemen,*—I am particularly pleased to have this invitation to appear before the District Dental Society tonight to present to you one of the most important phases of public health work. It seems to me that it is always an inspiration for all agencies engaged in a particular line of work to know something of what is being done by similar agencies and co-operating agencies throughout the United States. I should like to outline very briefly the general plan of the Public Health service in co-operation with the local, state, and health officials, in carrying on a nation-wide campaign for the control of venereal diseases. For many years a small group of persons—doctors

—were interested in this great problem of the venereal infections, but we lacked background for the statements which were quite frequently made in regard to their prevalence, on account of the inadequacy of the statistics referring to these diseases. At the time the first call was made for soldiers, the medical officers were enabled to make physical examinations of these men, and to collect a great mass of statistics throughout the United States, from north and from south, from east and from west, from rural and urban communities, from white and negro soldiers. We had something on which definite statements could be based in regard to the prevalence of these diseases. The results were such as to bring it very forcibly before the medical officers of the army, and all others. The urgent necessity of some concerted action on the part of all the people of the United States, to help ameliorate the conditions existing, was apparent. At that time we had a particularly appealing note in the request for co-operation, in that we were engaged in war, and that anything which increased the national efficiency became a patriotic duty of every American citizen. So, with that impetus, the work went ahead very rapidly, and it has been said that the progress in venereal disease control in the past year could not have been accomplished in twenty-five years during ordinary times of peace. That is one of the beneficent results of our participation in the world war.

We brought before the public this particular phase of public health, which heretofore had been neglected and the discussion of which had been taboo in polite society. The spreading of the necessary information to prevent infection was a subject that was only discussed between the physician and his patient, but now, thanks to the new idea of regarding these infections in the same way as other communicable diseases, and trying to eliminate the phases of these diseases which heretofore made them subjects not fit for popular discussion, people all over the United States are being aroused to the serious consequences

which have resulted from our neglect of this matter in the past. Congress was aroused to a sufficient extent to pass a law last July creating an Interdepartmental Social Hygiene Board, and establishing a division of Venereal Diseases in the Public Health service. This Interdepartmental Board has as its membership the Secretaries of War, the Navy, and the Treasury, and three physicians representing the three Surgeons-general of the Army, Navy, and the Public Health service, which is the agency bringing about the co-operation of all the departments of Health in the various states, to carry on a systematic and uniform campaign throughout the entire country, to endeavor to accomplish two things—to prevent persons from becoming infected, and to cure those who are already infected. By curing those already infected, we also prevent others from becoming infected, by terminating their period of infectiousness. The bill created by Congress carried an appropriation of a million dollars to be divided pro rata among the states and the District of Columbia, provided they complied with certain regulations promulgated by Congress governing the expenditure of this allotment. These regulations, in brief, were as follows: The state, in order to receive the sum to which it was entitled, should have a law requiring the reporting of all venereal disease cases. As physicians are required to report other communicable diseases, such as smallpox, typhoid, scarlet fever, etc., so should they report gonorrhea, syphilis, and chancre. Forty-four of the forty-eight states now have such a law or a state board of health regulation having the effect of law, so that at the present time there are only four states and the District of Columbia which do not require these venereal infections to be reported. In three of these four states we have assurance that these laws will soon be passed, probably before the end of the present fiscal year. In the other, we have the hope that some day they will pass the law. In each of the forty-four states there is a representative of the Public Health service

stationed to co-operate with the state Health executive or secretary, to carry on this uniform program, which has the three-fold phase—the medical, the educational, and the repressive measures.

The medical measures are the establishment of free clinics in all centers of population which are large enough to warrant it, where infected persons can receive free treatment by the best modern methods without any questions being asked or any fee being paid. In all of these clinics cases are diagnosed scientifically and the period of infection is determined by laboratory methods. We are making the treatment of these diseases available to many persons who heretofore were unable to secure proper treatment on account of lack of funds.

In the educational measures we have gotten out a lot of literature which we are distributing to various societies and clubs and agencies of various sorts to reach persons directly, and to warn young men about the manner in which these diseases are spread, and particularly to impress upon them the serious nature of the venereal infections. Erroneous ideas are widespread at the present time, because a few years ago young men thought that gonorrhea was no worse than a bad cold; that syphilis could be cured by going to Hot Springs for six weeks and it was all over. Those ideas have been responsible for a great deal of the taxation which our states are bearing at the present time. When young men and parents know that 25 per cent. of all the inmates of insane asylums are there because of syphilis, they would be more interested in preventing the spread of that disease. When they realize that there is no cause of sterility greater than that of gonorrhea, they would be more interested. It is costing us millions of dollars every year to maintain and educate the little children in blind asylums who are there because of having contracted gonorrhea at birth. The lawmakers would be ready to listen to the state board of health when the state legislature is asked for an appropriation to extend this venereal control work. In this educational cam-

paign we are trying to bring home these important truths to the laity. Doctors have known these things for many years, but they have not had the facilities for spreading this information broadcast throughout the country; and until we get our entire citizenship interested and ready to assume their responsibility in assisting and maintaining adequate clinics for venereal disease patients, so that the spread of these infections may be prevented, we can get nowhere on the road. The response we have met to this educational appeal has been something tremendous. As a result of mailing out one pamphlet we had over 26,000 individual letters, which were handwritten, and stamped, and sent in to the Public Health service, acknowledging receipt of the pamphlet and asking for further information. That shows that those pamphlets reach the hands of people who are really impressed by the information which they carry.

The other phases of the educational work are the handling of lectures before various audiences all over the country, and the use of moving-picture films. One film you are going to see tonight; I will just say a word about it. This film, "Fit to Win," was originally designed to be shown to soldiers in the various cantonments, and was then entitled "Fit to Fight." It met with such great success with the men that we put this film into civilian circulation through the Public Health service. We have shown it to rotary clubs, fraternal organizations, and commercial bodies all over the country, and it has aroused great interest in getting people to realize the seriousness of the venereal infections. Practically all state boards of health are co-operating with us in endeavoring particularly to interest the medical profession and the druggists, and the dentists, and all those who come into contact with people, in the success of this campaign. We have sent out to all the physicians in the United States circulars asking them to promise to report their venereal disease cases, in accordance with the local regulations. We sent out 133,830 of these very recently, and more than

50,271 replies have been received, where the doctor would sign his name on the dotted line and promise to help in every way in this campaign. We are starting also to enlist the support of medical, dental, and pharmaceutical colleges and organizations of that kind—because the ultimate success of the program depends on the backing we get from the medical profession, the dentists, the druggists.

The dentists should report all venereal infections the same as physicians. When they come into contact with syphilis or gonorrhea, the dentist would be bound by the law of the state, where the state has such a law, to report these diseases, and in many states we are getting some cases reported by dentists. I omitted to say in connection with reporting, that the preferred plan is to report by serial number. It is not necessary to know the name, sex, or address—all they need to know is that there is a case of one of these diseases. When the physician or dentist reports the case by serial number he assumes the responsibility for seeing that the patient takes the necessary precautions. Should these patients not continue the treatment, it is clearly the duty of the attending physician or other person to report it to the health authorities so that precautions may be taken to prevent its spread. The liberty of anyone who conducts himself so as to make himself a menace to the public health has reached the point where his individual liberty ceases to count.

From September 1, 1918, to January 31, 1919, there were 26,000 venereal disease cases reported by physicians of one state to the board of health. That does not mean that that state is particularly heavily infected, however. It means that the state board of health is getting support from the physicians. When all physicians report their cases we shall have all of the states showing up just about the same. There was not a great deal of difference all over the United States. It depended largely on the literacy or illiteracy in the state, or whether there was a preponderance of white or colored. The differences were not so very marked, so it is a problem of uni-

versal appeal, to white and black, north and south, east and west, to the city and the country; all are exposed to these dangers of venereal diseases. There is no public health problem at the present time which merits to a greater degree the earnest support of all classes of American citizenship who are interested in the future welfare of our country than does this venereal disease problem.

When Congress meets again, they should be urged to pass a law requiring venereal diseases to be made reportable in the District of Columbia, so that the District may be placed in the class co-operating with the Public Health service and the Interdepartmental Board, along with the forty-four states that have these laws and are co-operating in this great nation-wide campaign. It is realized that the venereal disease control problem is one that will require a long period of years to bring to ultimate success. But soon we can show that the prevalence of these communicable diseases is gradually being reduced and that this generation is passing on to the next an untainted heritage.

Now that the world has been made safe for democracy by our fighting men in Europe, those of us who are working on better health problems can feel that something has been accomplished toward making the world safe for posterity.

Dr. BARNHARD. Dentists are more and more realizing the importance of their responsibility for their patients' health and for the health of the community. We are already familiar with the symptomatology of systemic disturbances. Today I was talking to Dr. Hunter, assistant dean and professor of bacteriology and pathology, of the Dental School. He states that now, with the improved curriculum of the George Washington University Dental School, they are giving special attention to focal infections, as well as to venereal diseases in general. By reason of Dr. Hunter having to leave soon we would like to hear from him next.

Dr. O. B. HUNTER, Washington. *Mr. President, members of the National Cap-*

ital Dental Society, and invited guests,—

It is quite an honor for me to be invited to speak before you this evening, and I am going to dwell, if I may, upon some of the problems that we have met with in our laboratory teaching. First, probably, I might discuss the situation in a general way; that is to say, the recognition of venereal diseases by dentists as well as physicians, and the co-operation between the physician and the dentist. Some time back, and not very far back, we had the "quack doctor." The quack doctor is very rapidly disappearing with the education of the general public. Some time ago we had the so-called "tooth-carpenter" dentist, and he is also rapidly disappearing. We had also in the veterinary line, for that matter, the old "horse-doctor." The old horse-doctor is rapidly disappearing as the veterinarian is coming to the front.

Proper medical supervision and control is the thing. The medical men and the dental men are striving for a higher plane of diagnosis and recognition of diseases, and an intelligent co-operation with the patient. All kinds of diseases, particularly those of infectious nature, are being studied very intensively, and many of them are now quite easy of recognition, so far as their differential diagnosis is concerned, which some few years ago was very difficult. The dentist's field is wide. A good many heretofore looked at the teeth, studied cavity preparation and proper filling of the cavities; they did not look much farther. As far as the surrounding tissues of the teeth were concerned, and the adjacent tissues of the mouth, and the relation of the entire body structure to the teeth—these were very little taken into consideration.

Today, however, the modern dentist not only examines the mouth, but he looks into the general systemic condition of his patient. And when he sees the manifestations of diseases which may be exhibited by local lesions in the mouth he refers the patient for treatment to the intelligent physician; and the intelligent physician, on the other hand, when he sees that his patient needs treatment of

his teeth, not only for cavities and various other dental surgical procedures, which have been necessarily heretofore done in part by the physician, he in turn refers the patient to the dentist. Thus the dentist and the physician, with proper co-operation, can accomplish a great amount of good. It is true that sometimes we find a great deal of bickering between dentists and physicians, but I believe that the time is coming when the physician and the dentist are going to meet on a common ground, and that it is going to be for the benefit of the public at large.

The policy that we have tried to institute in our dental school, and which we have been carrying out for some time in the medical school, is to give the dental student an intelligent understanding and make him fully acquainted with general systemic manifestations. He is shown the lesions resulting from focal infections in the mouth, as well as pathological conditions which are not entirely limited to the mouth. As Dr. Barnhard has correctly said, the mouth is many times a cesspool for the entire system. It is also very true, as he said, that the mouth is a better incubator than the best bacteriological incubator we have in the best laboratory. We can only approach nature with our culture media and our various degrees of aerobic and anaerobic conditions, but in the mouth we find many ideal conditions for the growth of bacteria, and there are hosts of bacteria which grow in the mouth and produce lesions which we cannot grow in the bacteriological laboratory.

Now, focal infection in most instances is highly characteristic of the mouth cavity. We have focal infections elsewhere, but the great majority of them originate in the mouth. These focal infections many times are serious, as they can result sooner or later in a general septicemia, resulting from a lymphatic or hematine absorption.

Now, it is true that gonorrheal conditions are very seldom met with in the mouth cavity, but nevertheless we do see them in the eye, producing conjunctivitis (ophthalmia) in children and adults.

Syphilis, on the other hand, is very frequently seen in the mouth, is very frequently transmitted from mouth to mouth, and it is possible to transmit this infection indirectly by instruments or by materials that are carried from one mouth to another. Therefore it behooves the up-to-date dentist to recognize these pathological conditions. We try to train our students to know these conditions as they meet them, so that when they observe such cases they will follow up the case and make an absolute diagnosis. We instruct them in the methods of diagnosing syphilis, etc. Syphilis manifested as a chancre of the lips, tongue, and tonsils can be absolutely diagnosed in most instances, although at many times primary lesions of syphilis, as well as secondary lesions, resemble many other conditions that are met with in the oral cavity. The dental student today is taught the use of the dark-field microscope; is taught the technique and the significance of the Wassermann test. He is taught also the characteristics and the mode of infection of the gonococcus, the differentiation from the streptococcus, what the difficulties are in curing its effects, and also the sequelæ that follow the continuance of the disease; he is taught the infectiousness of it, as he is also taught the many ways in which syphilis may be manifested. In the case of the gonococcus the dental student is also informed in regard to its morphological and staining qualities, how it is differentiated from other organisms in the conjunctiva, the pharynx, the mouth, and is instructed in the methods of staining and growing this organism so as to absolutely make a differential diagnosis. He is also instructed concerning other portions of the body which this organism involves, the method in which the organisms enter the genital organs, and where the prime focus is usually located, how this focus can extend and the differences in the pathological process in both the male and the female, and the resulting sequelæ. After we have instructed him in the general pathological producing qualities of the organism the student studies the tissues as they appear

under the microscope. He sees the actual cellular pathology; he sees the various changes produced by the organisms growing in the living tissues.

Of course, the student cannot expect to be an expert in the diagnosis of these diseases as soon as he graduates from a dental and medical school; nevertheless, he has the groundwork and can, with a very little study, learn to become very proficient in the recognition and diagnosis of these diseases. Not only is he instructed in the differential diagnosis of these pathological conditions, but in other diseases which are produced by infection. The student so instructed is capable, after graduation, of recognizing the various pathological and bacteriological manifestations in the human body. He is in a position then to co-operate with his local board of health and with the United States Public Health service.

I believe it is the wish of the U. S. Public Health service to get the co-operation of every physician and every dentist and every pharmacist in the United States, not only directly, but indirectly through the local board of health, and I believe that the Public Health service wishes more than that—it wishes that the physician and the dentist would take the initiative in this matter, so that with intelligent work along these lines a great good can be accomplished in the eradication of these venereal diseases, just as other infectious diseases, smallpox, malaria, etc., have been largely eliminated. With such co-operation I feel sure that the Public Health service will win out in the excellent work which they are undertaking.

Dr. BARNHARD. A better understanding between the medical and dental professions is highly desirable. Our work is merging more and more, so that it is becoming in some cases almost impossible to say definitely where the one leaves off and the other begins. This necessitates a more thorough understanding and a better ethics than sometimes has unfortunately been practiced. The dentist has great opportunities of observing the general physical condition of

his patients; they frequently speak to him in confidence, and this enables him to advise the patient correctly where to go for the alleviation of certain conditions for which, it is very plainly to be seen, he is in need of medical attention.

The next speaker is the dean of the dental school here. Dr. Mess is putting into practical application many of the things Assistant-dean Hunter spoke of this evening. He has recently taken the office of dean of this school, and we have already seen the big things he is starting to do, and we are expecting still greater things.

Dr. CARL J. MESS, Washington. *Mr. President, ladies and gentlemen*.—The chairman gives me more credit than I deserve, but if I shall have accomplished anything in the George Washington University Dental School it will be because of my friends in the profession, for they have lent me encouragement, and I am happy in this glorious work of helping to train young men and women in this noble profession. In this great work of control of venereal diseases we must not forget the necessity of the clean mouth and the importance of focal infection. The evidence is overwhelming. We need not say much about that, but we are with the United States Public Health service, for its activities are notable and far-reaching and are sure to be crowned with success.

Dr. BARNHARD. Col. La Flamme, the successor of Col. Logan, Chief of the Dental Service of the U. S. army, promised me he would try to be with us this evening, but at the last moment, circumstances preventing his presence, he sends his representative, Captain W. D. Vail.

Captain VAIL, Army Dental Corps. *Mr. President, members of the Public Service, ladies and gentlemen*.—I want to thank you for the very kind invitation which permits me to be here tonight. It is a personal pleasure, and if you will permit me, an official pleasure. Col. La Flamme, now chief of the Dental Service in the Surgeon-general's office, asked me to convey to you his sincere regrets in

not being able to be present this evening and to express to you his appreciation of the invitation.

This meeting, I take it, is indicative of the closer harmony developing between medical men and dental men, and it is especially pleasing to the dental man who is interested in his profession to watch this harmony develop. Recent investigations have clearly proved that the human mechanism must be considered as a whole, and that the man who treats his case symptomatically is doomed to failure, with the possible exception of minor ailments.

It is, of course, to be regretted that better harmony has not existed heretofore. Any discussion at this time as to the reason for this lack may be superfluous, but may I suggest that we, as dental men, out of courtesy to the medical men present and for the purpose of being perfectly frank among ourselves, admit that our training in the subjects of pathology, bacteriology, histology, and kindred subjects was not as intensive as it should have been, and that we were prone to neglect these subjects after leaving the college. However, we can just as honestly and just as frankly say that instruction in dental colleges on these subjects is becoming more and more thorough, and I believe we are safe in making the prediction that in the near future the dental man will take his place as a consultant and diagnostician. Already one of our more prominent men is devoting the greater part of his time to that phase of work, in the capacity of consultant and diagnostician in cases of obscure etiology. No longer does the dentist scorn the suggestion of the physician that a systemic disturbance may be the result of infection about the teeth, and it is also pleasing to note that no longer does the physician insist that the teeth are the root of all evil, but is willing to look a little farther and take into consideration the tonsils, middle ear, and other sources of entrance of infection into the general system.

If you will permit me to speak of the Dental Corps for a moment, I should like to say that we are proud of the

record which it has made during the war, and I do not believe I am transgressing by telling you that the demand for dental surgeons in the several base hospitals throughout the country is far above the quota allowed by law, which quota is three to a thousand beds in hospitals. It may be interesting to you to know that in a hospital not over fifty miles from this city we have twenty-one dental surgeons on duty, one-fourth as many dentists as were in the entire army previous to the declaration of war. Right here at home, at the Walter Reed Hospital, we have a staff of ten dental officers under the efficient command of Lieut.-col. Ames, and further have five graduate dental hygienists, whose duties are, in addition to prophylactic work, to instruct and to lecture to patients in the hospital on the care of oral cavity. The dental service in this hospital is furnished the name of every surgical case admitted to the hospital, and that patient is given a thorough oral prophylaxis treatment before an anesthetic is given.

And so it is throughout the various general hospitals; dentists are in demand for consultation and treatment in conjunction with medical officers. The dental surgeons have ample access to the laboratories in the hospitals, and it is believed that the dental service in army hospitals is of a higher quality than is found in most civilian hospitals, and it is hoped that in the future dentists in the army will not be considered merely as plasterers of amalgam and cement. If the plans for the Dental Corps which have been approved, subject to reorganization legislation, are carried through, the dentists in the army will have a rare opportunity for the future.

I understand that the remarks I make must be limited, and I fear that I have already exceeded my limit. Permit me to again thank you for the very kind invitation to be here this evening.

Dr. BARNHARD. You have heard from the U. S. army. We would now be glad to hear from Commander Cogan, Chief of the Dental Corps, U. S. navy.

Commander W. N. COGAN, Navy Dental Corps. It has afforded me much pleasure to be present this evening, and to listen to the very interesting talks of the gentlemen who have preceded me.

A training-school for our dental officers was established at Great Lakes, Ill., not only for our regular corps, but for our Reserve Corps as well. There were two courses given, and Dr. Grieves, who has made a life study of this work, had charge of instruction regarding focal infection. Our officers, therefore with the knowledge and experience they acquired at the school, went forth to the different stations fully capable of treating our naval *personnel* along this line.

It was most gratifying to me to learn from Major Mitchell that he found the mouths of the navy men with whom he came in contact at St. Elizabeth's in a very good condition, which is another proof that we have worked with zeal and earnestness; and at all times we have endeavored to co-operate with the medical fraternity.

I came this evening only to look and listen, not to talk.

I wish to thank the president and members for kindly inviting me to be present at this most interesting meeting.

Dr. BARNHARD. I notice that Major Mitchell is with us this evening. I am sure he can tell us something along the topics of the evening which will be of great interest.

Major LEONARD G. MITCHELL. Mr. President,—The lesson taught by this great picture and so ably emphasized by the different speakers is as interesting as it is important. All right-thinking citizens will indorse, without hesitation, this part of the great reconstruction campaign which has for its aim the rehabilitation of our country along new lines—new, at least, to this generation. As we note the general trend of affairs for the past twenty years, social, religious, and political, then try to see with prophetic vision the logical results and influence upon our national life, we must recognize the great need for a campaign of education along new lines. Good health

is the logical basis or foundation upon which to build the superstructure of contentment, prosperity, and happiness; therefore this evening's program should command our most thoughtful consideration.

What relation do teeth bear to these "social diseases," with special reference to syphilis? Inasmuch as 90 per cent. of the people of the nation have bad teeth, let us note the relation between these bad teeth and this dread disease. The germs from a syphilitic ulcer on the lips or in the mouth are easily conveyed to the lips of another, and by the action of the tongue and saliva, carried inside the mouth. Through the medium of kissing, drinking-cups, or any article which has been in contact with a syphilitic, and touches the lips, teeth, or gums of another, syphilis is conveyed. This, of course, includes instruments.

If there is a cavity, particularly one with nerve involvement, or a break in the continuity of the gum line, as in the case of pyorrhea, the syphilis germs may gain entrance to the blood stream. The lessened resistance to disease germs by reason of pyorrhea only makes easier the infection in this way. Thanks to a wider knowledge of the relation of bad teeth to so many physical ailments, the army has seen fit to make provision for dental service for its men to a degree never before reached. The Surgeon-general's office has been increasingly interested in observing the good results accruing therefrom, as evidenced in many ways. At the beginning of the war the allotment for the dental service was one dental officer for each one thousand men; after observing the results of a little over a year's work, expensively equipped unit buildings were provided in our camps and the number of dental officers was doubled.

It is my conviction that there is no department of the Surgeon-general's office rated higher, from the standpoint of conservation of health, than this one. Not only have the dentists wrought a great work in the army, but with the aid of co-operating dentists in civil life we have placed dentistry and its importance

on a much higher plane throughout the country. Because of its importance in this great work of conservation of health we are to be a most important factor in this campaign of education for a higher and a better citizenship. That the dentists of the country are taking cognizance of this is evidenced in many ways. The old style dental meeting has given way to the scientific instruction kind—bringing in outside men of prominence to lecture and give clinics, forming study clubs, and giving special courses wherein newer and better methods are studied and learned. Truly it may be said of dentistry, "The old order passeth away; behold all things are new."

Dr. BARNHARD. Major Heckard has also honored us with his presence, and all dentists know something of the great work in the Preparedness League of American Dentists that the major has done, but I hope he will tell us more about it this evening.

Major W. A. HECKARD, Army Dental Corps. I came over this morning from Fort McHenry, general hospital No. 2, where we are doing oral surgery and restorations. Representing the dental department, I am desirous of keeping in touch with what is going on elsewhere, so I visited the face and jaw department of Walter Reed Hospital and then called at the Surgeon-general's office to see Lieut.-col. La Flamme and Captain Vail, and was invited to be here tonight, though I did not understand that I was to talk. I did not even know the purport of this meeting nor had I the slightest idea of what I was coming into, else I might have been frightened away, but I am glad now that I came. I am very much interested in this research, as I am in all research, and I feel sure that anything the army dentist is called upon to do that will help will be done. Regarding the dental profession I might state, from my experience as supervisor of the Preparedness League of American Dentists, I was in a position to see what dentists will do for a good cause: 16,000 of them joined the League, filled teeth, extracted teeth, and rendered prophyl-

laxis free of charge. Some 10,000 went into the Dental Corps of the U. S. army. But, speaking of the League, there were more than a million free dental operations performed by civilian dentists, 680,000 actually recorded operations were filed. To carry on a work of this size I had a large office force of as many as 25 to 30—this I mention because I have alluded to the fact that I was in a position to see what dentists were thinking about; and I believe that you can count on them for co-operation in any progressive movement. That people want to learn and are hungry to learn is shown by the large audience of men, women, and young ladies present here this evening, listening to and talking about sex matters; and surely the time has come in this world when the people must be shown. It is an indication of quite a different state of affairs from the time when to say "leg" instead of "limb" gave offense.

Today, love, friendship, sex matters, and health matters are discussed fundamentally and interest is maintained because of the results so clearly manifested, and when I hear a discussion such as I have here this evening in such a sane manner by an interested mixed audience, and realize that these matters and others like them are to be taken up by the schools, I wish to observe, as I have on other occasions, that we are living in a day when the schoolhouse is the cathedral. I thank you.

Dr. BARNHARD. You have heard from the army and the navy and the Public Health service, but we must not forget another faithful service that has been with us all along. We have often overlooked it, although the health of the people of the District of Columbia is important to all of us. The gentleman whom I am about to introduce has founded a clinic for the treatment of venereal diseases, gratis to poor and unfortunate people who are unable to pay a physician, and Dr. Wm. C. Fowler, our health officer, would be glad, I believe I am safe in saying, to tell us all about it.

Dr. WM. C. FOWLER, Washington. It is not my purpose to enter into any dis-

cussion of venereal diseases or the dangers arising therefrom. I shall simply tell you in a very few words something of the activity of the local health department along these lines. First of all, I want to say that our health department is in hearty and active co-operation with the Public Health service. Dr. Pierce referred to the fact that the District of Columbia is one of the few places in the United States that has no law for the control of venereal diseases. I want to say, however, that there is pending in both committees of Congress—House and Senate committees—a bill which if enacted into law will confer on the health officer the power to require the reporting of these diseases, and enable him to take steps to prevent their further spread. In this Act, if it should become a law, physicians and other persons will be required to report to the health department all cases of venereal diseases coming under observation. Dr. Pierce referred to the fact that the patient's name would not necessarily have to be made known. That provision of the law has been arranged for in this way—the patient can make his report by a serial number. If, however, this patient becomes unruly, if he refuses to comply with existing regulations, or if he leaves the jurisdiction, his name will then have to be reported so that he can be followed up.

Dr. Pierce referred to the fact that there was a million dollars appropriated by Congress to be pro-rated among the several states which had enacted laws for the suppression of these diseases. The District of Columbia not having enacted such a law, is not entitled to its pro rata, which, I believe, amounts to \$3500. Notwithstanding the fact that we are not entitled to this pro rata, the Public Health service has furnished the District with literature which the health department has distributed. This \$3500, in the event the health department becomes entitled to that amount, will be utilized in extending venereal disease control work in the District; but, aside from that, Congress has appropriated a small sum of money for the establishment and maintenance of a venereal disease clinic, which has been established and is

now in operation at 409 15th st., N. W. This clinic is one of the best-equipped clinics of its kind in the country. The service was begun in the early part of November, and the attendance has gradually increased until it has now gotten to be considerable of a "service" and so much so that it looks as if we would have to find some additional days. At the present time the clinic is operated on Monday, Wednesday, and Friday afternoons at 2 P.M., and also a clinic is held at 7.30 P.M. on Saturday. The physicians are all men who are recognized as specialists in their particular line of work.

It might be of interest to you to give you some figures to show how this service has grown. The clinic started in the early part of November. During that month there were only three clinic days, and five cases applied for treatment. In December there were eight cases; these were all new cases. In the month of January 61 new cases presented, in February 73, in March 91. These figures will show you that this service is growing rapidly. The service is for both sexes. We have in connection with this clinic one nurse only employed at the present time. Her duty is to assist the physician in attendance while treating patients, and also to follow up, as far as she can, cases which apply to the dispensary for treatment and who fail to return. In other words, the department does not want to lose track of any person who once applies for treatment, until that person has been cured. The appropriation we have is small. We have \$5000 appropriated, from which we have to maintain a clinic for the treatment of persons suffering from tuberculosis and also venereal diseases. We have to maintain both of them out of that appropriation. The building we have was practically given to us, or lent to us by the U. S. Treasury department. I want to say that the health department is greatly indebted to Major Pullman, chief of police, for securing that building for us.

The health department is anxious to have the co-operation of every citizen of the District in maintaining this clinic. It wants the co-operation of the medical

profession and of the dental profession, especially. We have in connection with this clinic the services and the facilities of the health department's laboratory, and this laboratory is a well-equipped one. The blood tests, the Wassermann tests, smears, are examined and all other laboratory work is done without cost to those persons who apply. We will examine any person who applies. We will not, however, treat persons who are financially able to pay for such treatment. We will examine them, make the diagnosis, and advise them, but the treatment in the case of those who are able to pay is not given without cost, but those who are unable to pay are treated without any expense whatever.

I extend to all persons present an invitation to visit the building where this clinic is located. I do not want you there while the clinic is going on, but visit the building and inspect it, see how it is equipped, and I feel that having done so, you will have no hesitation whatever in recommending anyone that you may know, to the clinic for treatment. I thank you.

Dr. BARNHARD. I have some knowledge of the thought of the dentists of Washington, and I believe I am safe in saying that the dentists of Washington will give the United States Public Health service their hearty co-operation in forwarding this great educational movement. I do not believe many people have fully grasped the vastness or the importance of this great work. An official of the Public Health service told me the other day that they consider this work second only to the cleaning up of Panama.

In regard to the gentleman whom I am about to introduce, I am able to say that after he was graduated in medicine from Vienna, he entered the diplomatic service as *chargé d'affaires* of the American embassy there. Through his training, it seems, he has been qualified for the work of introducing this great educational work and advertising it throughout the entire country. I went into his office the other day and I could hardly

find a path to his desk. I think Dr. Herdliska is about the busiest gentleman I have ever known. The literature he was working on filled the entire floor. I managed to get in, and he immediately put me to work. I asked him what I was going to get out of this. He said I was going to get a job out of it. I told him I already had a job, but that a very important thing the medical profession could do for the dental profession would be to bring about a better co-operation between the two professions so as to loyally combine our influence in a merger of our interests. In this way any movement of an educational or legislative nature would be full of force and produce better results. I am glad to say that the doctor gave his favorable reply as to what he could do in this direction. This gentleman is Dr. Chas. V. Herdliska, who will introduce the film "Fit to Win."

Dr. CHAS. V. HERDLISKA, Acting Assist. Surgeon, U. S. Public Health service. *Ladies and gentlemen*.—The time limit set for the speaking has been far exceeded, and in order to enable you to see the film promptly I shall say but just a word. The motive power of any propaganda is in its literature. The official literature of the Public Health service in this propaganda against venereal diseases consists of two kinds—one kind, the reprints by the Government printing-office of articles which first appeared in the Public Health reports, issued weekly by the Public Health service; the second kind, miscellaneous publications issued by the division of Venereal Dis-

eases of the Public Health service. The reprints from the Public Health reports are mostly scientific in character, whereas the miscellaneous publications are for every phase and walk of life. There is literature for the industrial plant and the commercial institution; for railroads and shipping, for the church, the club, the community center, the home, the libraries, and the schools; for the high schools, the colleges, and the universities.

The Public Health service has placed an exhibit of Public Health reprints on one of the bulletin boards, and an exhibit of miscellaneous pamphlets on the other, for your inspection after the meeting. Copies of the reprints may be had from the Government printing-office; the miscellaneous prints may be had free on application to the Surgeon-general of the United States Public Health service. For this particular meeting tonight, in which the dental profession and dental schools of the country are interested, the Public Health service has prepared a selected set. This set is contained in envelopes, one of which may be obtained by each of you at the door as you leave the hall.

The war has brought the great American awakening. In the prosecution of this propaganda, authorized and directed by Congress, the Public Health service not only solicits but feels assured of your sympathetic interest and enthusiastic co-operation.

The film "Fit to Win" was then shown, after which Dr. Barnhard declared the meeting adjourned.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDWARD C. KIRK, D.D.S., Sc.D., LL.D., *Editor.*

L. PIERCE ANTHONY, D.D.S., *Associate Editor.*

PUBLISHED BY THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

SUBSCRIPTION PRICE, including postage, \$1.00 a year to all parts of the United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Virgin Islands, Cuba, and Mexico. Canada, \$1.40. To other foreign countries, \$1.75 a year.

Original contributions, society reports, and other correspondence intended for publication should be addressed to the EDITOR, Lock Box 1615, Philadelphia, Pa.

Subscriptions and communications relating to advertisements should be addressed to the BUSINESS MANAGER of the DENTAL COSMOS, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, NOVEMBER 1919.

EDITORIAL DEPARTMENT

Venereal Disease and the Public Health.

WE ask the careful attention of our readers to the report in this issue of the campaign by the Bureau of the Public Health Service to "Enlist the Co-operation of the Dental Profession in the Fight Against Venereal Diseases."

Dental literature contains comparatively few records of cases of syphilitic contagion through the medium of dental operations, possibly owing to disinclination upon the part of dentists to report them by reason of the involved stigma of reproach which would attach to the operator, the patient, or both, as the case may be, or possibly because mouth-to-mouth transmission of syphilis is of rare occurrence by reason of the safeguards imposed by correct dental technique, or, finally, it may be that the infection *per orem* is less contagious than it is generally believed to be.

Nevertheless, as the communication of the Surgeon-general points out, the data secured as part of the Health Service activities of the war, have brought into critical focus the vital importance of a crusade to control and in so far as it may be possible eliminate this disease, which has been a blight and curse upon humanity from the dawn of history. Syphilis has been classed as a venereal disease, and popularly it is exclusively regarded as such; yet so able a syphilographer as Dr. L. Duncan Bulkley, in his studies of extra-venereal syphilitic infection has expressed the opinion that because syphilis is capable of transmission by such a variety of means other than sexual, it is not properly classified as a venereal disorder in the restricted sense of the term. It is no doubt possible to convey the spirochete of syphilis from one individual to another through the medium of infected dental instruments or appliances or the unclean hands of a careless dental operator. The writer once had opportunity to inspect a primary syphilitic lesion involving the gingival margin of the left upper canine tooth in the mouth of a German housemaid who had received the infection by using the toothbrush belonging to a commercial traveler who was a boarder in the house where she was employed. Investigation developed the fact that the owner of the toothbrush was syphilitic and at the time had a number of mucous patches on his buccal mucous membrane. The housemaid in due course developed secondary symptoms and a typical case of syphilis. These cases are, however, comparatively rare, and when one considers the unlimited opportunities for mouth-to-mouth infection which arise in dental practice where proper precautions are not taken to avoid such a contingency, one is forced to the conclusion that, quite apart from the virulence of the infection, its contagiousness is relatively less than that of the ordinary exanthemata.

It is therefore in relation to its virulence rather than on its contagiousness that the importance of the national crusade for the elimination of syphilis rests. At no previous time has the problem of combating the propagation of venereal diseases been approached from so sane and logical a standpoint as that by which the National Public Health Service is undertaking to rid the nation of this menace to the virile efficiency of its people. At no previous time in human history has so dramatic an array of data bearing upon the widespread character and damaging effects of venereal

disease been available as is now at hand as a result of our war experience. We have heretofore approached the problem from the moral side almost exclusively, and broadly speaking the appeal has ended in failure. Our Government now inaugurates a crusade from the sanitary standpoint analogous in principle to its attacks upon the yellow fever problem, tuberculosis, typhoid fever, or any other disease which is devastating the health of the nation—and, let us hope, with the same prospect of success that has crowned its previous efforts at disease control and extinction.

To the dental profession is given opportunity of a special character to observe and diagnose syphilitic manifestations in the human mouth—an opportunity which implies and carries with it the obligation to co-operate in the effort which the Government under which we live is making to eliminate this scourge of humanity. We therefore feel that the appeal of the National Public Health Service needs no indorsement from us in order to secure the hearty co-operation and furtherance of the whole dental profession of America.

Transactions of the Inter-Allied Dental Congress, Paris, 1916.

[THE attention of the institutions concerned is directed to the following courteous offer.—Ed.]

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—The Government of the French Republic has charged me to offer in its name to each of the schools represented in the American Institute of Dental Teachers a copy of the report of the Inter-Allied Dental Congress held in Paris in September 1916, and especially devoted to the study of the treatment of wounds of the jaws and the face, and to the organization of dental service during the war. This shipment will be made directly; the volumes will arrive at New York, and will be addressed to the interested parties through the kindness of Mr. W. Leeming, 170 Fifth ave., New York City.

I shall be grateful to you if you will have the kindness to announce in the DENTAL COSMOS the sending of these volumes as

a mark of esteem on the part of the French Government for the educational corps of the dental schools and faculties of America.

With cordial thanks and expressions of high regard, I am

Very truly yours,

[Signed] - GEORGES VILIAIN.

PARIS, July 29, 1919.

BIBLIOGRAPHICAL

THE CONDENSED CHEMICAL DICTIONARY

—A Reference Volume for all requiring quick access to a large amount of essential data regarding Chemicals and Other Substances in Manufacturing and Laboratory Work. Compiled and edited by the Editorial Staff of the *Chemical Engineering Catalog*. F. M. TURNER, Jr., Technical Editor. Assistant Editors: D. D. Berolzheimer, W. P. Cutter, John Helfrich. Published by The Chemical Catalog Company, Inc., 1 Madison Ave., New York City. 1919. Price: \$5 in library buckram.

A careful review of this work justifies the conclusion that its contents fully measure up to the objectives set forth in its title.

It too frequently happens in the great mass of special reference books that the particular feature upon which one desires information is conspicuous by its absence, or that the description is vague or inadequate to a degree that leaves the investigator not only hopelessly confused

but usually irritated over the time lost in the hunt for what he needs.

The present work will be a boon to those who seek information within its scope. Not only does it cover a wide range of chemicals and other substances, but the descriptive matter is of that practical character which recognizes the type of information that the non-technical person most requires, and presents it in a clear, concise form which is readily understandable.

While the book is intended primarily to meet the needs of those who buy, use or sell chemicals or are concerned with these products in a commercial sense, yet the work will prove invaluable to all who in the course of their life activities require a source of easily accessible information on the subject.

In its selection of matter, in its treatment thereof, and in the clarity of its presentation of practical information on the topic of which it treats, the book is in our opinion unique, and will be indispensable to those whose interests embrace the field which it covers or any portion thereof.

REVIEW OF CURRENT DENTAL LITERATURE

[*Lancet*, London, August 23, 1919.]

Perverted "Functional" Activity in the Production of Jaw Deformities. BY D. F. SHAW.

This paper is peculiarly interesting in the light of Roger's views (*DENTAL COSMOS*, 1918, p. 857). The particular deformity to which Shaw here gives the greater attention is protrusion of the maxillary teeth. In a future communication he proposes to show that perverted activity of the tongue (and it is perverted activity of this muscular organ which the author emphasizes throughout the present contribution) may also bear a causal relationship to two other jaw deformities—(1) inferior protrusion or "underhung" bite and (2) open bite. The following abnormalities are found associated in the majority of cases of protrusion of the maxillary teeth: (1) The high level attained by the alveolar anterior border of the mandible, permitting the overlap of the maxillary incisors over the mandibular; (2) shortening of the body of the mandible; (3) increased depth or low level of the premolar and molar region in both maxilla and mandible; (4) some narrowing of the arches; (5) a backward "bite" of all or nearly all the mandibular teeth.

It is a remarkable fact that if and when this excessive overlap (*supra* 1) is in any particular case once established, the several other abnormalities mentioned above must then of mechanical necessity be concomitant, if not actually consequent, features. This statement requires qualifying in regard to the fourth abnormal feature, inasmuch as the arch in some cases does not undergo a general narrowing.

The excessive overlap is a feature of many cases other than those of superior protrusion. To Shaw, it shows some promise of being the masterkey to the causal explanation of many jaw deformities, and to the question of its origin, he applies himself in this article.

Certain foodstuffs, constituting a large proportion of the daily intake (including cereals, breadstuffs, sweetened puddings, porridge, sweets, jam, confectionery) are manipulated and "mashed" by the tongue against the anterior surface of the palate. Sucking actions are often involved, and among the several reflex actions excited by very sweet substances is a frequent strong pressure of the anterior dorsal surface of the tongue against the front of the palate—a kind of "tongue mastication" which, while admittedly falling within the limits of normal function when performed occasionally, becomes abnormal or perverted when exercised frequently, supplanting normal mastication by the molars. The tongue is brought into this position against the anterior surface of the palate chiefly by the contraction of the geniohyoglossal muscles. By this contraction the mandible is subjected to a backward pull at and about the region of the genial tubercles, which backward traction is abnormal just in proportion as the forward thrust of the tongue is abnormal in force and frequency of action. When the plasticity of the mandible, especially during the period of odontogenesis, is considered, such abnormal stress must result in inhibiting and disorganizing growth and producing deforming changes in the shape of the bone. The backward or centripetal pull of the genioglossus and "sublingual" muscles produces retrusion of the mandible.

Excessive overlap (abnormally high level of incisive border of the mandible).

During eating, sucking, etc., the part of the tongue whereat pressure is applied against the palate and anterior maxillary teeth lies at a higher level than the bony area of attachment of the genioglossal muscle. Therefore in the resistant pull of this muscle upon the tongue there must be a downward as well as a backward component, the general substance of the tongue being at the same time

stiffened to a quasi-rigidity by a number of other muscles. When holding the raised tongue against the resistance offered on or at the anterior submaxillary surfaces, the genioglossal fibres are perforce inclined markedly upward, so that (reaction being equal and opposite) their contraction must exert an obliquely upward and backward pull upon their place of origin on the mandible. Under this upward tensional stress the young, "unready" bone is strained, and very slowly and gradually yields in an upward direction.

The force of the pull is distributed on and about just that very region where the apices of the anterior deciduous teeth and the crypts of the permanent ones lie, so that it would undoubtedly tend to produce the hitherto unexplained variety of phenomena found associated with uprising of the alveolar border—"apical crowding" and "anterior crowding," the "fan" arrangement, etc.

The "low level" of the mandibular post-canine teeth is a further and almost inevitable consequence ensuing from the downward component of the tongue's pressure upon the diaphragmatic floor of the mouth, whereon the base of the muscle-stiffened tongue finds the necessary resistance to its own upward thrust. The digastric and geniohyoid muscles play a considerable part in supporting the upward thrusting tongue, but certainly the mylohyoid "slings" upon which the tongue is seated must exert a downward pull upon those inner surfaces of the mandible from which they are hung. When the tongue is small and narrow, the supporting mylohyoid sheet may attain a more nearly horizontal plane, and its pull will then be the more directly inward, tending to draw the two sides of the mandible together.

In conclusion, perverted activity of the tongue is harmfully frequent among children, and is incited chiefly in the oral manipulation of foods, a preponderant amount of which is of a sweet, soft, or glutinous nature; and also less frequently by the crippling or (from whatever cause) insufficient use of the molars.

There is of course the danger of going to the other extreme, and offering too much tough food. This will condition the forward thrusting and holding action of the tongue (between the incisors). The mandible is subjected to an upward and backward traction,

giving rise to an excessive overlap as well as some degree of postnormal occlusion.

It is so self-evident that the forward thrust of the tongue would cause the protrusion of the upper teeth that this fact is only mentioned. The great majority of superior protrusion cases are associated with inferior retraction.

The central thought of Shaw's studies is embodied in the following generalization: The tongue exerts a centrifugal pressure on the maxillæ anteriorly, and the main resistance and reaction to the tongue's thrust takes effect as a centripetal traction on the mandible.

[*American Journal of Ophthalmology*,
Chicago, March 1919.]

Spasm of Accommodation with Disturbance of Ocular Movements, of Dental Origin. BY G. D. MURRAY.

The patient, a man of fifty years, complained that every time he looked away from the median line, either to the right or left or up or down, he would become so dizzy as to almost fall. This dizziness was accompanied by severe pain in the eyes and temples. In the physical examination, roentgenograms were made of six incisors (the only teeth left in his mouth, and which, though showing marked attrition, looked sound), revealing three large abscesses and one unerupted tooth immediately beneath the abscesses. The unerupted tooth and the abscessed teeth were extracted. The man's headaches and dizziness were completely and promptly relieved (patient was under observation for one month after dental treatment).

[*Comptes rendus de la Société de Biologie*,
12 Avril 1919, lxxxii, p. 384.]

Elimination of Potassium Iodid in the Urine and Saliva. BY AMEUILLE AND SOURDEL.

In the normal subject after intravenous injection of 5 cg. KI, the reaction for I clearly appears in saliva in from five to seven minutes, in urine in from eight to ten minutes. The iodine content in these fluids rapidly reaches a maximum, and there remains during the elimination (four or five hours). This observation is based on ten experiments, and establishes the fact that

the normal subject eliminates KI in a parallel manner in the urine and saliva.

As might be supposed, in two cases of renal insufficiency the elimination through the urine was reduced or arrested, and increased through the saliva. However, in all other patients (number not stated) the fact was that the saliva eliminated no more KI than the urine. The iodid seems to be fixed and retained in the tissues under these conditions.

[*Archives of Pediatrics*, March 1919.]

Dental Infections in Children. BY A. L. SMITH.

This report covers 109 cases of periodontal infections, 4 of secondary fistulæ, 8 of gingival abscesses, 1 abscess in roof of mouth, and 1 infected submaxillary gland. The age of the children ranged from two and a half to eleven years. The figures after the names of the following organisms represent the number of times found: *Streptococcus hemolyticus*, 27; *S. pyogenes*, 19; *S. viridans*, 2; *Micrococcus citreus*, 9; *M. aureus*, 37; *M. albus*, 7; *M. lanceolatus* (*pneumococcus*, type undetermined), 18; *M. catarrhalis*, 4; *Pseudomonas pyocyanea*, 1; *Bacillus fusiformis*, 1; diphtheroid bacilli, 3; and sterile, 8.

[*Canadian Medical Association Journal*, July 1919.]

Focal Infection and Chronic Urticaria. BY HUGH MACKAY.

Three cases are given. In one case the focus was in the tonsils. The second case concerned a man of forty-three years, with urticaria of seven to eight months' duration. Removal of the tonsils was followed by considerable improvement in the skin condition. Symptoms of angioneurotic edema were still present six months after tonsillectomy.

Roentgenograms showed many areas of rarefaction around the teeth, which were extracted. An autogenous streptococcal vaccine from the teeth was administered. In six months all the lesions had faded away. There was no further outbreak. The patient denies himself nothing in the way of diet.

The third concerned a male, of nineteen years, with urticaria of ten years' duration. Extraction of two infected teeth (roentgenographic diagnosis) showed no apparent benefit. There had been frequent attacks of

tonsillitis. Tonsillectomy was performed, with administration of autogenous vaccine. The condition gradually improved.

MacKay summarizes his experience as follows: To meet with success, operative interference must be thorough and far-reaching. Exacerbations in the efflorescence have frequently been observed immediately following removal of septic foci. In recent infections, removal of focus alone has been followed by symptomatic cure. In chronic cases, vaccines appear to be of service in hastening resolution and building up immunity. They should be administered with caution, since anaphylactic phenomena are specially prone to appear in victims of this distressing disorder.

[*Therapeutic Gazette*, February 15, 1919.]

A Study of Blood-Pressure Changes During Nitrous Oxid-Oxygen Anesthesia. BY W. B. DAVIS AND W. H. SPENCER.

The clinical bearing of this study lies in the fact that the view is still held by some that nitrous oxid-oxygen anesthesia is *always* accompanied by a rise in blood pressure, and is therefore contraindicated as an anesthetic in cases having sclerotic arteries and myocardial degeneration. The blood pressures were taken by the auscultatory method on the right arms of patients, recumbent on a flat operating-table. The ages ranged from ten to eighty-three years. The Tyco's aneroid apparatus was used, and all the patients above sixteen years received, one-half hour preceding the operation, $\frac{1}{4}$ gr. of morphin sulfate and 1/150 gr. of atropin sulfate. The following conclusions were reached:

(1) In a series of 53 cases, in 15 per cent. there was a rise of blood pressure of from 10 to 50 mm. of mercury.

(2) In 25 per cent., a rise of 10 mm. or less at some time during the anesthesia.

(3) A rise in blood pressure was always accompanied by rigidity, jactitation, or lividity.

(4) In 8 per cent. no blood pressure changes were shown.

(5) In 15 per cent. there was a fall of less than 10 mm. of mercury.

(6) In 37 per cent. there was a continued fall of from 10 to 30 mm. of mercury.

(7) In 85 per cent. there was either no change, a fall, or a negligible rise.

(8) Nitrous oxid-oxygen anesthesia is not

accompanied by a rise in blood pressure if a sufficient amount of oxygen is admitted to prevent rigidity, jactitation, or lividity.

Compare Casto, *DENTAL COSMOS*, 1915, p. 881; 1917, p. 415; and 1918, p. 633.)

[*Bulletin de la Académie de Médecine*, Paris, 1919, No. 81,646.]

Normal and Pathologic Cytology of the Submaxillary and Parotid Salivas. BY LA PRÂDE AND LOIRET.

The material was gained by catheterizing Stenson's and Wharton's ducts. To provoke the flow of saliva, the authors thought that natural physiologic conditions were the most favorable, and in the large majority of cases this was done by chewing bread. Microscopically examined, 132 salivas: Normal, 22 submaxillary and 16 parotid, and from cases of mumps in various stages, 48 submaxillary and 46 parotid. The saliva was centrifuged, smeared on slides, and stained with phenolthionin, and hematein and eosin. At the height of acute mumps and in chronic and recurrent cases no peculiar cytologic character was found. The cytologic content of the submaxillary saliva is approximately the same as that of the parotid saliva, with the rare exception of the presence of mucous cells. The cytologic content is about the same in respect to the nature of the cellular elements whether the individual be healthy or affected with mumps, but in the saliva from mumps, whether of parotid or submaxillary origin, the cellular elements are less common (75 per cent.) than in normal salivas (94 per cent.); in other words, the inflammatory reaction of mumps appears solely to diminish the frequency of glanular exfoliation into the saliva.

[*Gazetta degli Ospedali e delle Cliniche*, Milan, May 8, 1919.]

Diastemia in Its Relation to the Pathogenesis of Dental Caries and to Variations in Cuspal Topography. BY U. FABRIS.

Fabris, in an examination of 1255 soldiers, noted that a large majority of those who presented the condition of diastemia were affected with dental caries more or less marked, and furthermore these same individuals presented variations in cuspal topography, especially of the premolars and molars.

By the term "diastemia" is meant the condition in which spaces, *i.e.* diastemas, exist between the teeth. His observations are summarized in the following table:

1. With normal dentures ..	470	37.5%
2. Both diastemas and caries	327	26.0
3. Caries, but not diastemas	109	8.6
4. Diastemas, but not caries	32	2.6
5. Diastemas and cuspal variations	318	25.4

Compare percentages 3 and 4 and contrast with percentage 2; also compare especially percentages 2 and 5. It is upon these correspondences and contrasts that Fabris bases his statement.

Fabris, in suggesting a mechanism, argues thus: The diastema and the cuspal variations represent a developmental arrest, which also expresses itself as a weakness of Nasmyth's membrane and of the enamel, thereby affording readier progress of dental caries.

Roberts (*DENTAL COSMOS*, October 1917) gives another, or at least a supplementary, interpretation to the condition of diastemia, considering it pathognomic of congenital syphilis.

[*British Medical Journal*, July 26, 1919.]

Dental Conditions at an Ante-natal Clinic. BY J. W. BALLANTYNE.

Ballantyne here reports a systematic dental examination of 100 consecutive, unselected patients at the ante-natal clinic in the Edinburgh Royal Maternity Hospital. The first and most outstanding result of the examination was that in only 2 patients were all the teeth present in an undecayed condition (one a primipara of twenty-three years and the other a secundipara of the same age). Fifty-six per cent. of the women were twenty-five years of age or less. Twenty-two of the women had suffered from toothache or neuralgia during the present pregnancy (some of the remaining 78 were edentulous). Ballantyne concludes with emphasizing the existence among the working-class mothers of an alarming amount of dental deficiency and disease with, in not a few cases, concomitant oral sepsis. These conditions cannot fail to react injuriously upon the mother's digestion, and through it upon the nutrition of her unborn infant. They may also retard the

return to complete health and strength in the puerperium, even if they do not increase the danger which always exists then of septic infection. They cannot be helpful in lactation. Ballantyne clearly recognizes the need of systematic dental care during pregnancy.

[*American Journal of Syphilis*, St. Louis, April 1919.]

Secondary Syphilitic Periosteitis of Mandible: Report of Case. BY L. B. KINGERY.

This case, in so far as could be determined by an earnest search of the literature, is almost unique, in that the periosteitis affected the mandible alone. It concerns a man of sixty-three years, complaining of a painful swelling of the jaw, beginning four days before Kingery saw the patient. Examination showed over the right side of the jaw an olive-sized, rounded mass, definitely circumscribed, of firm consistence, and exquisitely sensitive to pressure. Objectively the mass was connected to the bone. Entire absence of redness, temperature, and fluctuation at once eliminated the possibility of the process being due to a suppurative condition of the

underlying tissues. Likewise the possibility of a neoplasm was excluded. Penile lesions, erosions of the mucosæ, inguinal adenitis, and a four-plus Wassermann confirmed the diagnosis of mandibular periosteitis secondary to syphilis. Under routine antisyphilitic treatment, rapid and uneventful symptomatic recovery was made. The periosteitis was one of the first lesions to disappear.

[*Lancet*, London, July 26, 1919.]

Case of Multiple Epulides. BY W. WARWICK JAMES.

In this case, the growth of a fibrous epulis (hypertrophy of the fibrous tissue of the gingival mucoperiosteum) has been associated with each tooth of the deciduous and permanent series which has erupted. Seven separate operations were performed, and an attempt was made to save the teeth, but recurrence followed. All the deciduous and eight of the permanent ones have been extracted, the growth completely excised, and the margins of the alveolus removed. Nothing in the history of the girl (age eleven years at the time of the writing of this report) can explain the condition.

PERISCOPE

Chronic Fistula from a Buried Deciduous Tooth.—A short time ago a man, age forty-six years, called at my rooms with a note from a surgeon requesting the extraction of a loose lower right first bicuspid, and stating at the same time that he was going to open up the lower jaw for necrosed bone. The man presented a running fistula on the point of the chin, over which he had been unable to shave for some time.

Out of curiosity—for I suspected the cause to be dental—I examined the lower arch behind the newly extracted bicuspid. I was nearly giving up my examination when I discovered a sinus with a most obscure opening situated slightly beyond the place usually occupied by the second bicuspid. On exploring, I followed the sinus down into the

alveolus and felt what, to the touch, seemed to be hard structure, which I concluded was a buried root. The history showed that an extraction was attempted at this spot, without success, some fifteen years before.

I communicated my discovery to the surgeon, who, after examination, handed the case over to me as "dental." With great difficulty I succeeded in removing the "buried root," which, to my great astonishment, proved to be an inverted second deciduous molar, with its roots broken almost to the crown—probably in the attempted extraction fifteen years previously. Within a fortnight the fistula on the chin had completely disappeared, and the patient was able to shave with normal ease and comfort.—J. A. CAMPBELL WILSON, *Commonwealth Dental Review*.

To Protect Synthetic Cement Fillings from the Saliva.—Instead of using wax or the varnish supplied by the manufacturers, use ordinary surgical collodion; it is cheaper and better.—*CECIL NORTON, Commonwealth Dental Review.*

A Quick Filter.—A nice and quick way to filter water for hypodermic use is to boil the water in a teaspoon over a common flame, place a small piece of absorbent cotton in the spoon, and draw the liquid into the syringe through the cotton. By so doing you get a perfectly clear solution.—*Dental Surgeon.*

Cleaning Teeth.—Instrumentation should never be done with more force than just sufficient to remove the deposits; more will unnecessarily annoy the patient, and may injure the tissues. The movements in scaling should be gentle and deliberate, but positive, moving quietly into the remotest recesses after the hidden deposit, and having located it, the effort should be to remove it as quietly and gently as though one were trying to get away with it without waking up the entire neighborhood. One tooth, or group of teeth, should be taken at a time, and thoroughly scaled before going to the next, unless the removal is particularly difficult, tedious, and painful, when it may be wise to give that particular spot a rest. The use of iodine to soften and stain the deposits will facilitate their removal.—*Dental Surgeon.*

Dental Examination a Requirement of Employment.—The Metropolitan Life Insurance Co. of New York City, has issued an edict that dental examination is now a requirement of employment in that institution, reading as follows: "The services rendered by the dental division since its establishment in 1915 have been so curative of impaired health conditions and so permanently helpful to the employees who take advantage of the opportunities offered, that henceforth every home office employee will be required to undergo examination and cleansing of the teeth in the home office dental division twice a year. If the service of the family dentist is desired rather than that of the home office dentists, such examinations and cleansings by him will be accepted, but they must be procured without expense to the company, and the employee must furnish a satisfactory certificate from him that the required work has been done." This, we believe, is the first time in the world that such a requirement has ever been made by any large company.—*Dominion Dental Journal.*

Dental Treatment.—A national scheme for the report by the Departmental committee on the Dentists Act contained a recommendation that steps should be taken without delay to recognize dentistry as one of the chief, if not the chief means for preventing ill-health, and every possible means should be employed for enlightening the public as to the need of conservative treatment of diseased teeth, and that treatment should be available for all needing it.

In view of this declaration, the British Dental Association have formulated a scheme for a complete public dental service, which is now under the consideration of the responsible authorities. The scheme includes a Dental section of the Ministry of Health under a dental director. Provision would also be made for the dental treatment for expectant mothers and for children up to five years of age; dental inspection and treatment of all children of school age; dental treatment for all adults whether entitled to National Insurance benefits or not; and dental treatment as an essential in the cure of tuberculosis and of venereal disease.—*London Times, August 11, 1919.*

Pharmacology of Local Anesthetics.—The more important literature of acute intoxication in man from the local anesthetics is reviewed by Eggleston and Hatcher, and cases are cited to show the close similarity between the symptoms produced in man and in the lower animals, especially the cat. The phenomena of acute intoxication in the cat, following the intravenous injection of the local anesthetics, are described, and the similarity of the phenomena produced by different members of the group is emphasized. The maximum toxicity for each of the members of the series has been determined by rapid intravenous injection in the cat, and the relative toxicities of the several drugs are represented graphically. The several different local anesthetics are shown to be mutually and quantitatively synergistic, so far as their fatal actions are concerned. The capacity of the cat to withstand the intravenous injection of several times the fatal vein dose of any of the local anesthetics, except cocaine and holocain, has been shown by repeated injections of large doses, or the continuous injection of relatively dilute solutions. The toxicity of the local anesthetics for the cat, after subcutaneous injection, has been shown to depend on the ratio between the rate of absorption and that of elimination, and the local anesthetics can be divided into two classes with reference to that ratio. Five or

more than five times the minimal fatal vein dose of alypin, apothetin, beta-eucain, nirvanin, procain, stovain, and tropacocain can be injected subcutaneously in the cat without causing death, while four or less than four times the fatal vein doses of cocain and holocain similarly injected prove fatal. The simultaneous subcutaneous injection of epinephrin with the local anesthetics materially reduces the toxicity of the latter by delay in the rate of their absorption, but this reduction is much less marked in the cases of cocain and holocain than with the other members of the series, and is referable to their much slower "essential" elimination. The absorption of several of the local anesthetics from the mucous membranes of the nose and pharynx of the cat has been shown to be no more rapid than from the subcutaneous tissues, and the urethra, bladder, and vagina resist the absorption of these drugs to a great extent. The elimination of the local anesthetics in the cat has been demonstrated to be due to their rapid destruction by the liver, and this takes place in the excised, perfused organ as well as in the liver of the intact animal. All of the local anesthetics have been shown to be synergistic with epinephrin on the blood pressure in a manner analogous to cocain. The employment of artificial respiration, combined with stimulation of the heart by the intravenous injection of epinephrin, is capable of saving cats from death following the intravenous injection of as much as twice the average fatal dose of the local anesthetics. Stimulation of the heart by the previous injection of ouabain permits the cat to recover from intravenous injections of nearly twice the average fatal dose of the local anesthetics, when the temporary paralysis of the respiratory center is combated by the use of artificial respiration. The success of the last two measures depends on the rapid destruction of the local anesthetics by the liver.—C. EGLESTON and R. A. HATCHER, *Journ. Amer. Med. Association*.

The Nesbitt Removable Bridge: Modified Technique. Take an impression of the abutment teeth after they have been ground to clear the occlusion. Also take a wax bite at this time; varnish as above, and run the model in Standard investment compound and allow this to harden well. Now take an impression of the abutment teeth separately or individually, with one of the small hinged trays that Dr. Roach uses for this purpose. (A small door hinge can be bent

into shape for this). This has the advantage of allowing the tray to be opened after the impression has set in the mouth, thus facilitating the removal of the same from the tooth without too much mutilation. Varnish, and run these impressions up in the investment that is to be used in the casting of the clasp. After they have hardened, remove, and wax up the clasp on these forms. Soak the same in water, and attach sprue wires to the wax forms, which have been left on the tooth form of inlay investment compound; then put all on the sprue-former, place ring around them, invest in the usual manner, and cast. After clasps are cast, clean them and remove all nodules and rough places, and place them on the other model that has been run in Standard investment compound at the beginning. Assuming that the dummies are ready to place on the model for soldering, wax the same to the dummies. Now soak this Standard model in water, and it will be very easily trimmed down small enough to admit of being placed in a soldering ring and invested, for final attachment of the clasp to the dummies, when the bridge will be complete. This method does away with the teasing off of the wax forms from the model, and also does away with having to remove the clasps from the model after placing them there the first time, thus doing away with the liability of making some mistake by making too many changes.—W. M. CURT, *Texas Dental Journal*.

The Gold Inlay: Indirect Method.—The idea is to get a correct model of the cavity and the surrounding teeth, and to do this a double impression is taken. Make a cone of Kerr impression material like those supplied with Peck's or Taggart's wax. Heat carefully over the alcohol flame so that the point is softer than the base. Take an impression with this as for the direct method; when set, see that it draws, trim up roughly, and replace in the cavity. With the same material in a small tray take another impression over this one, and including the neighboring teeth. The first impression, being set, cannot distort when it comes out embedded in the second impression. When a plaster cast is made from this you have a perfect impression of the cavity and the surrounding teeth. You can now carve up your wax inlay on this model unhampered by the lips, cheeks, tongue, saliva, etc. You can try the wax inlay in the mouth, if desired, to see that you have the edges, bite, contact point, etc., perfect.

If you like you can prepare several cavities in the same mouth, and bring them out in the same impression. The advantages of this method are obvious for large inlays. To me it is a most difficult thing to carve a large wax inlay in the mouth. You simply cannot get at it; whereas with this method you can get all round your model, and have everything perfectly dry. I do all my large inlays this way, and you will nearly always find some of these models on my bench. The inlays I show you tonight are made on the plaster models, and you can see for yourselves how they fit the prepared cavities in the teeth.—Mr. ROEBUCK, *Australian Journ. of Dentistry*.

Dental Deficiency During Pregnancy.—

Opinions differ considerably as to the effect of carious or defective teeth upon the general health, and there has been a good deal of more or less acidulated discussion on the subject. So much has been written on oral sepsis that it is unnecessary to dwell upon it at any length. At the same time it is being more generally recognized that this condition does exert a bad influence on the health, and that in the best interests of health it is always advisable to have the teeth and mouth put into as sanitary a condition as possible.

Dr. J. W. Ballantyne of Edinburgh writes in the *British Medical Journal*, July 26, 1919, concerning dental conditions of patients seen at an ante-natal clinic. His experience, from

a systematic examination of the teeth of one hundred patients attending the ante-natal clinic in the Edinburgh Royal Maternity Hospital, was that, speaking broadly, these patients revealed a most "imperfect dental exhibition." His conclusions were that of one hundred expectant mothers drawn from by no means the poorest class, most of them enjoying a fair measure of health, half of them primiparæ, and more than half under twenty-five years of age, ninety-eight had more or less defective teeth.

In this country teeth are better cared for than in Great Britain, and there is not the same widespread dental deficiency. Still, the war has shown that dental defects are too prevalent in America, and doubtless many women of childbearing age are afflicted with decayed teeth. The suggestion of Dr. Ballantyne that temporary dental physicians should be appointed to maternity hospitals not already provided with them, in order that women about to leave the hospital may have their mouths inspected and be given advice as to treatment, is therefore applicable and expedient, to some extent, in America. Ballantyne is inclined to be skeptical regarding the supposed danger of treating or extracting teeth during pregnancy. He believes that this view is based on false premises, and holds that custom should be revised. The entire question of the teeth during pregnancy is well worth looking into.—EDITORIAL, *New York Medical Journal*.

OBITUARY

Dr. Newell Sill Jenkins.

[SEE FRONTISPICE.]

DIED, suddenly, at Havre, France, September 25, 1919, in his seventy-ninth year, NEWELL SILL JENKINS, D.D.S.

Dr. Jenkins was born in Falmouth, Mass., December 29, 1840, the son of Charles Weston Jenkins, a shipowner, and Phœbe (Bishop) Jenkins. He received his early education in the Farmington School, Me. Dr. Jenkins came from generations of ancestors who had to do with the seas as captains and ship-

owners, and it was only natural that at an early age, with his spirit of adventure, he should wish to go to sea. Accordingly in his early manhood plans were made for shipping on one of the American clipper ships so famous at that time. At the last moment, however, owing to the distress of his mother, he gave up this adventure, and decided to study dentistry, inasmuch as his health was not of the best and he felt that he wanted to pursue a career which would enable him to live wherever he chose. He therefore entered the Baltimore College of Dental Sur-

gery, from which institution he received the D.D.S. degree in 1863, and immediately thereafter located in Bangor, Me., where he entered upon the practice of his profession.

After the close of the civil war, desiring to find a climate better suited to his health, and believing in the great possibilities of dentistry abroad, Dr. Jenkins proceeded to Germany, and upon the advice of his friend, Dr. Francis P. Abbot, settled in Dresden. Here Dr. Jenkins practiced for more than forty years, enjoying an international practice. For many years he numbered among his patients many of the nobility of Germany, Russia, Italy, and Austria, and for a number of years practiced for one month each year in Vienna and Warsaw to give attention to his Austrian and Russian *clientèle*. He received from the King of Saxony the title of "Geheimer Hofrat," which is the highest title that can be given a professional man. He was also decorated with the Albrechts Order by the King of Saxony.

During his residence in Germany, Dr. Jenkins developed the material well known to dentistry as "porcelain enamel." In this work he was most ably assisted by his wife, who performed the thousands of experiments necessary to bring this material to perfection, and for which Dr. Jenkins in the pressure of active practice could not possibly find the time. Five years before the outbreak of the recent war Dr. Jenkins retired from practice, and removed to Paris, France, where he spent the major portion of his time devoting himself to research work and writing.

On his seventieth birthday the American Dental Club of Paris tendered him a banquet to express their admiration and regard for his achievements in dentistry. Representatives from practically every dental society in Europe were present, and also from England and America, and gifts were showered upon him of every description, but above all, his election to honorary membership in every European national dental society was prized by him as a recognition of what he had done for dentistry.

Dr. Jenkins never gave up his American citizenship in spite of his long sojourn abroad, and he brought his children up as Americans and was at heart always loyal to his own country.

Dr. Jenkins was either an active or hon-

orary member of every national dental society of Europe, including Great Britain, and the United States. In addition to his membership in the National Dental Association, he was an honorary member of the New York State Dental Society, from which society he received the Fellowship medal in 1910. He was an honorary member of the Second District Dental Society of New York, the Connecticut State Dental Society, and numerous other societies in America. He was a member of the American Dental Society of Europe, and served as president of that society for several years; a member of the American Dental Club of Paris, which society he also served as president. He was also for many years an active member of the International Dental Federation, devoting his activities in that society to the advancement of Oral Hygiene.

Dr. Jenkins was one of that group of distinguished practitioners who brought to Europe the ideals and methods of American dentistry. He had been preceded by Abbot of Berlin, Brown of Frankfurt a/M., Evans of Paris, and Maynard, who for a time was dentist to the Russian court. These early pioneers had established standards of excellence in practice and ethical ideals which brought recognition and high appreciation for the service which they rendered and made the phrase "American dentistry" an "open sesame" to abundant patronage of all who legitimately practiced it. It was into this atmosphere established by his predecessors that Dr. Jenkins was introduced by his friend Dr. Abbot of Berlin, one of the original pioneer group. Success and fame quickly followed as the just and indeed inevitable result.

Added to his skill as a practitioner, Dr. Jenkins possessed an ingratiating personality which was the outward expression of his kindly, sympathetic nature and his love of humanity. He was endowed with a studious habit of mind and keen powers of observation, qualities that he brought to bear with success in his researches leading to improvements in practical technique, but more broadly in his relation to life activities. These same qualities intensified his interest in public affairs and made his advice sought after in many social and political activities. His love of humanity, his kindness and sympathy,

strengthened the many friendships that he made in his long and active life. His faith in the inherent goodness of mankind was but the reflex of his own frank and inherently honest nature, so that his friendship was a benefaction to those that possessed it. His passing removes the last of a distinguished group whose service and character gave luster to the reputation of dentistry in the field of their activities. His was a life well lived, full of splendid achievement, crowned with honor by his colleagues and the love of all who were privileged to know him as he was.

Dr. Jenkins was married on June 8, 1865, to Miss Clara Elizabeth Upton of Bangor, Me., who, with his son, Leonard A. Jenkins, and two daughters, Mrs. Nora Cornelius Shear and Mrs. Grace Madeline Gow-Gregor, survives him. Dr. Jenkins' remains will be brought to this country and interred in the family burial-ground at Bangor, Me.

Dr. Otto Zsigmondy.

Now that the veil is lifted we gather something of the happenings in dental circles in those countries which, before the war, formed the Empire of Austria-Hungary, and to our great regret we learn of the death of Dr. Otto Zsigmondy, on June 30, 1917, age fifty-seven. Zsigmondy was at one time a student at the Royal Dental Hospital, and attended some annual meetings of our association. He also visited most international dental congresses, and being a man of singular charm of manner as well as of scientific eminence, made a large circle of friends. Among his compatriots he is ranked in esteem with Heider, who is accepted as the founder of modern dentistry in Vienna. Zsigmondy as a youth desired to devote himself to the study of history, and only turned to dentistry at the wish of his father, who was a pupil of Heider. He followed his brother, Dr. Emil Zsigmondy, to whom he was much at-

tached, in becoming a noted Alpine climber, and the great sorrow of his life happened on August 6, 1885, when climbing together in the Dauphiné Dr. Emil fell and disappeared into the depths. Dr. Zsigmondy refused professorships at Prague, at Graz, and at Innsbruck, preferring to continue among his *clientèle* in Vienna. His work on "Hypoplasia" attracted much attention in this country.—*British Dental Journal*.

Dr. A. E. Matteson.

DIED, at the home of his daughter, Mrs. Lescher, in Galesburg, Ill., on April 18, 1919, ARTHUR E. MATTESON, D.D.S., Chicago, Ill.

Dr. Matteson was born in the little town of Berwick, Ill., on April 28, 1842, being therefore almost exactly seventy-seven years of age. He began the study of dentistry with Dr. Stone of Kansas, later with Drs. Mason and Elliott of Quincy, and with him it was a study that was never finished, for his active mind and high inventive ability caused him to be ever trying to improve the prevailing methods of practice. His inventions were many and valuable, and besides this he was on the faculty of the Northwestern University Dental School, the Missouri Dental College, and the Chicago College of Dental Surgery. In addition to these varied accomplishments he was also a valued contributor to many standard textbooks and to the best of our professional magazines.

Dr. Matteson was a pioneer in every movement for the advance and betterment of his calling, in which practice he continued until the infirmities of advancing years forced him to retirement.

Dr. Matteson was a member of the Chicago Dental Society, and a life member of the Illinois State Dental Society, having joined the state society in 1869. He held several administrative offices, and was a member of numerous committees.

ARMY AND NAVY DENTAL NEWS

Surplus Dental Outfits.

REPRESENTATIVE LAYTON in J. Res. 222, proposes directing the Secretary of War to dispose of surplus dental outfits as follows:

Whereas, on November 11, 1918, the day the armistice was signed, there were in round numbers 5000 commissioned dental officers on duty; and

Whereas, since the discharge of a large majority of these dental officers there are many thousand dental outfits in the hands of the Government and not in use; and

Whereas, these outfits will inevitably deteriorate and become useless in a short time if stored away as they now are; and

Whereas, thousands of these dental officers who before entering the service disposed of their private outfits, are now without them; therefore be it

RESOLVED, That the Secretary of War is hereby authorized and directed to dispose of all dental outfits not in use, and not immediately needed by the Government: *Provided*, That they shall be sold preferentially to an honorably discharged dental officer, and at a price not to exceed 25 per centum of the first cost to the Government: *Provided further*, That after the period of six months after this act goes into effect, these dental outfits may be disposed of to the general trade: *And provided further*, That all dental outfits or parts thereof so purchased shall be invoiced, packed, and delivered to any railroad station within the United States designated by the purchaser without additional cost for packing and shipping.—*Army and Navy Register*.

Assignments.

Navy Dental Corps.

Week ending September 13th.

Lieut. Harold A. Badger, detached from second replacement battalion, marine barracks, Quantico, Va.; to navy yard, New York.

Lieut. James M. Campbell, detached from Newport News division transport forces, Atlantic Fleet; to N. T. S., Hampton Roads, Va.

Lieut. William A. Domey, detached from U. S. S. *Aeolus*; to marine barracks, Quantico, Va.

Lieut. Edward A. Hyland, detached from

navy yard, New York; to duty with separate battalion marines, Camaguey, Cuba.

Lieut. Cedric T. Lynes, detached from marine barracks, Quantico; to duty at naval prison, Portsmouth, N. H.

Lieut. Conrad H. Nelson, detached from marine barracks, Quantico, Va.; to Virgin Islands.

Week ending September 22d.

Lieut.-commander T. L. Campbell, detached from navy yard, Charleston, S. C.; to naval training station, Hampton Roads, Va.

Lieut. F. S. Weir, detached from U. S. S. *Delaware*; to naval academy.

Lieut. John E. Morgan, detached from U. S. S. *Mount Vernon*; to U. S. S. *Fulton*.

Lieut. Charles R. Wells, detached from naval operating base, Hampton Roads; to duty at navy yard, Charleston, S. C.

Week ending September 27th.

Lieut. Joseph L. B. Murray, detached from receiving ship at New York; to Rockaway Beach, L. I.

Lieut.-commander Logan A. Willard, detached from U. S. S. *President Grant*; to naval training station, Hampton Roads, Va.

Lieut. Eugene L. Walter, detached from U. S. S. *America*; to naval hospital, New York.

Lieut. Louis F. Snyder, detached from Naval Academy; to naval training station, San Francisco, Calif.

Lieut. Adien F. Fitzgerald, detached from Newport, R. I.; to naval hospital, Newport.

Lieut. Wm. H. Wood, detached from the Connecticut; to the North Dakota.

Week ending October 6th.

Lieut. Patrick F. Kennedy, detached from receiving ship at Philadelphia; to U. S. S. Connecticut.

Lieut. James F. McGrath, detached from U. S. S. *Buffalo*; to U. S. S. *Virginia*.

Lieut. Errol W. Willett, detached from U. S. S. *Virginia*; to U. S. S. *Buffalo*.

Army Dental Corps.

Week ending September 20th.

Lieut.-col. George I. Gunkel, to Columbus Barracks, Ohio, for duty.

Lieut.-col. Herman S. Rush, honorably dis-

charged as lieutenant-colonel only, to take effect September 30th.

Maj. William C. Webb, Jr., report in Southern Department for duty.

Maj. Charles C. Mann, to Camp Jackson, S. C., for duty.

Capt. Beverly M. Epes, to Williamsbridge, N. Y., general hospital 1, for duty.

Capt. Leslie A. Gould, to Fort McHenry, Md., general hospital 2, for duty.

Capt. Francis M. Tench, to Fort Hancock, N. J., for duty.

Week ending September 27th.

Lieut.-col. Lester C. Ogg, to Camp Shelby, Miss., for duty.

Maj. Arthur J. Hart, to Denver, Colo., general hospital 21, for duty.

Week ending October 4th.

Col. Frank P. Stone to Fort Logan, Colo., for duty.

Lieut.-col. William S. Rice to Washington, for duty in attending surgeon's office.

Lieut.-col. Lester C. Ogg to Columbus Barracks, Ohio, for duty.

Capt. Arthur T. Burchill to Millington, Tenn., air-service flying school, Park Field, for duty.

Capt. William S. Shuttleworth to Jefferson Barracks, Mo., for duty.

Resignation by Capt. Norman M. MacKenzie accepted.

1st Lieut. George B. Curtis from Philippine Department to San Francisco, and report to commanding general Western Department for duty.

1st Lieut. George B. Curtis at San Francisco, Calif., report to commanding general Western Department for duty.

1st Lieut. James S. Dailey to Camp Normoyle, Tex., for duty.

The following to duty at hospitals; Col. S. David Boak, Walter Reed General Hospital, D. C.; Major James B. Harrington, Fox Hills, N. Y., general hospital 41; Capt. James J. Weeks, Fort Sheridan, Ill., general hospital 28; Capt. James B. Mann and George A. Cloutier, Jr., Fort McHenry, Md., general hospital 2.

Week ending October 11th.

Major Emmett P. Varvel to Camp Dodge, Iowa, for duty.

Major Harry E. Smalley to Jefferson Barracks, Mo., for duty.

Capt. Emory C. Bardwell to Fort Monroe, Va., and coast artillery training center for duty.

Capt. Roy R. Newman to Indianapolis, Ind., aviation central repair depot, for duty.

Capt. Maximilian P. Bergeron to Camp Dodge, Iowa, for duty.

1st Lieut. Wm. F. Scheumann to East Potomac Park, Washington, for duty.

SPECIAL NOTICE.

Mouth Hygiene Campaign by the Army Medical Department.

The War Department authorizes the following statement from the
Office of the Surgeon-general.

AN active campaign of education in the interest of mouth hygiene is being fostered by the Army Medical Department. "Come Clean" is the title of a three-reel picture and lecture prepared by Major Leonard G. Mitchell, Dental Corps, which will be circulated by the Interior Department and other organiza-

tions in the hope of convincing people of the necessity of caring for their teeth.

The Surgeon-general of the Army and an increasingly large number of America's leading surgeons, pathologists, and research men, now recognize the diseased mouth and teeth as causative factors of many of the serious diseases of the body.

It is pointed out in the pictures that the unclean and diseased mouth in its relation to systemic diseases is one of the most serious health problems which confront the people today.

The motion picture used to illustrate the lecture was produced at the Army Medical Museum in this city by direction of Surgeon-general Ireland, with a view of impressing upon our soldiers the great importance of freeing the mouth of all infection and maintaining strict mouth hygiene.

Major Mitchell says, "The very early training of children must not be neglected, if they are to have strong teeth and good health. Thumb-sucking and the use of a pacifier cannot be too strongly condemned, as they cause constriction of the arches and nasal passages, causing mouth-breathing, adenoids, enlarged tonsils, and irregular teeth, with their long train of systemic ills, which will materially affect the general health and life of the individual. The deciduous, or first teeth, must be saved until the normal time for them to be replaced by the permanent teeth. These first teeth provide the required development of the jaws and guide the permanent teeth into their proper position. The first permanent molars, which erupt at the age of six, are the most important of all the permanent teeth, yet are the most neglected. The loss of one or more of these teeth means loss of normal occlusion, inability to properly chew, and the tipping into the space of the second molar when the third molar erupts. This condition is also responsible for pyorrhea later in life."

Children should have "plenty of coarse food which requires much chewing; also food such as milk and eggs, which contain plenty of lime."

The picture shows the formation of a cavity, and how if neglected the pulps become involved, with the forming of an abscess, and also how various parts of the body are reached and become diseased. It does not sufficiently empha-

size, however, the danger of the blind abscess, which does not open through the gum to the surface or cause pain. This form of abscess will occur when the dental pulp has been removed and the canals imperfectly filled. The formation of pus in such an abscess is so slow that the blood circulation can absorb and carry it to all parts of the body, producing no swelling of the gum or pain about the tooth. This tooth may do its work without pain to the individual, yet establish a serious infection in some other part of the body. The process being painless is insidious and dangerous.

The X-ray is proving that a very small percentage of root-canals are properly filled. Major Mitchell advises that the tooth with the pulp removed should be X-rayed in order that the patient may see for himself that the canals are well filled and that there is no infection. A dentist cannot do root-canal work without the use of an X-ray.

Several of the scenes in the film were taken at the Walter Reed Hospital, Takoma Park, D. C., where there are on record many cases where these blind abscesses, resulting from poorly filled canals, have been the cause of serious diseases of the body.

It is pointed out that the loss of teeth from pyorrhea is a serious one. The bone process is so destroyed that there is little left to hold plates, rendering it impossible to properly chew food. In ordinary chewing with natural teeth, a stress of from 180 to 300 pounds is exerted, while with well-fitting plates the stress is but 30 pounds. This abnormal tax on our digestive system makes serious inroads on our vitality.

State legislatures are urged to provide adequate protection for society against incompetent and unscrupulous dentists, so that a license to practice is evidence to the public of efficiency, skill, and honesty—as the physical welfare of the people takes precedence over all other matters.

SOCIETY NOTES AND ANNOUNCEMENTS

Dental Protective Association of the U. S.

THE annual meeting of the Dental Protective Association of the United States will be held at the Palmer House, State and Monroe sts., Chicago, on the third Monday of December, the 15th, at 4 P.M. sharp. The report of the officers will be given, a board of directors will be elected, and such other business transactions as should come before the association. All members are urgently requested to be present.

By order of the Board of Directors,

J. G. REID, *President*,

J. P. BUCKLEY, *Vice-president*,

D. M. GALLIE, *Treasurer*.

Ohio State Dental Society.

THE fifty-fourth annual meeting of the Ohio State Dental Society will be held in Memorial Hall, Columbus, Ohio, December 2, 3, and 4, 1919. A varied program of papers and clinics on topics of present-day interest insures a meeting both interesting and instructive. Members of other state societies are cordially invited to meet with us.

F. R. CHAPMAN, *Sec'y*,

305 Schultz Bldg., Columbus, Ohio.

Bronx County (N. Y.) Dental Society.

THE Bronx County (N. Y.) Dental Society will hold a dental educational meeting with postgraduate clinic courses and manufacturers' exhibits, at the Hotel Commodore, December 2, 3, 4, and 5, 1919. Indorsed by First and Second District Dental Societies.

There will be essays by some of the most prominent men in the profession, who will tell us something that will be of help to the general practitioner.

Progressive postgraduate clinic courses will be given by the Detroit Dental Clinic Club. The reputation of this body of men for their fineness of technique and their ability to demonstrate and teach their methods is such that

no one should miss this opportunity. Courses will be limited as to number, and as to number who can take them.

The grand ballroom will be given over to the manufacturers' exhibit, which will be one of the largest ever held in this city.

BRONX COUNTY DENTAL SOCIETY.

Marquette University.

THE annual meeting of the Dental Alumni Association of Marquette University will be held on February 11, 12, and 13, 1920, in the Milwaukee Auditorium, Milwaukee, Wis.

V. A. SMITH, *Sec'y*,

Milwaukee, Wis.

Nebraska Board of Examiners.

THE Nebraska State Board of Dental Examiners will hold a regular examination at the Capitol and the Nebraska College of Dentistry, November 17, 18, 19, and 20, 1919.

For applications and information, address

H. H. ANTLES, *Sec'y Dep't Public Welfare*,
State-house, Lincoln, Nebr.

Illinois Department of Registration and Education.

THE Department of Registration and Education of Illinois will hold an examination for dentists in Chicago, the week commencing Monday, November 10, 1919. Address

F. C. DODDS, *Sup't of Registration*,
Springfield, Ill.

Connecticut State Dental Commission.

THE Dental Commissioners of Connecticut will meet at Hartford, November 20, 21, and 22, 1919, to examine applicants for license to practice dentistry, to examine applicants for dental hygienist's license, and to transact other business proper to come before them.

For further information, address

EDWARD EBERLE, *Recorder*,
902 Main st., Hartford, Conn.

Rhode Island Board of Registration.

THE regular semi-annual meeting of the Rhode Island Board of Registration in Dentistry for the examination of applicants will be held in the State-house, Providence, R. I., November 4, 5, and 6, 1919. All applications with proper fee must be filed one week previous. For further information address

E. A. CHARBONNEL, *Sec'y*,
334 Westminster st., Providence, R. I.

Maryland Board of Examiners.

THE Maryland Board of Dental Examiners will meet for examination of candidates for certificates in Baltimore, Md., on November 19 and 20, 1919.

For application blanks or further information apply to

F. F. DREW, *Sec'y*,
701 N. Howard st., Baltimore, Md.

New York State Examinations in Dentistry.

POSTPONEMENT BY THE BOARD OF REGENTS.

Abstract: Because of interference with the course of instruction, caused by the emergent inauguration of the Student's Army Training-corps in connection with dental schools,

* * * * *

it has been formally decided by the Board of Regents to postpone the June dental examination until the first Tuesday of September, and the September examination until the second Tuesday of November.

There was therefore no June dental examination held in this state in 1919, but this will not affect examinations in subsequent years.

AUGUSTUS S. DOWNING,
Assist. Commissioner of Education,
Albany, N. Y.

California Board of Examiners.

THE next meeting of the Board of Dental Examiners of California for the purpose of examining applicants for a license to practice dentistry in this state will be held in the city of San Francisco, beginning on the 6th day of December, 1919, at 9.30 A.M. Each applicant shall file with the secretary of the board at least ten days before that date the following credentials: (1) Diploma or certificate of graduation from a reputable dental college approved by the board. (2) A diploma from an accredited high school or a certi-

cate signed by the state superintendent of public instruction (or similar officer) to the effect that the applicant has had scholastic preparation equivalent in all respects to that demanded for graduation from a high school giving a four-year course of instruction. An applicant who has been a licensed practitioner of dentistry of some other state of the United States for a period of at least five years shall file such license or licenses, which will be accepted in lieu of high-school credentials. (3) Testimonial of good moral character. (4) A recent unmounted photograph of the applicant.

For further information address

C. A. HERRICK, *Sec'y*,
133 Geary st., San Francisco, Cal.

Texas Board of Examiners.

THE Texas State Board of Dental Examiners will hold its next examination in Houston, Texas, at the Texas Dental College, beginning Monday, December 1, 1919, and continuing through December 4th. The examination fee is \$25, and must accompany all applications. The Texas dental law does not provide for the issuance of a temporary license nor reciprocity with any other state. Applications should be in the hands of the secretary at least five days before the examination.

For further information and application blanks address

HARRISON B. CAVE, *Sec'y*,
Wilson Bldg., Dallas, Tex.

Pennsylvania Board of Examiners.

THE next examination of the Pennsylvania Board of Dental Examiners will be held in Philadelphia and Pittsburgh, on Wednesday, Thursday, Friday, and Saturday, December 10, 11, 12, and 13, 1919. The theoretical examinations will be held in Musical Fund Hall, Philadelphia, and University of Pittsburgh, Pittsburgh. The examination in practical work will be held on Wednesday, December 10th, at 8.30 o'clock, at the Philadelphia Dental College, Philadelphia, and the University of Pittsburgh, Pittsburgh. Application papers may be secured from the Department of Public Instruction, Harrisburg.

For further information apply to

ALEXANDER H. REYNOLDS, *Sec'y*,
4630 Chester ave., Philadelphia, Pa.

New Jersey Board of Registration.

THE State Board of Registration and Examination in Dentistry of New Jersey will hold their regular examination in the State-house, Trenton, N. J., December 1 to 5, 1919. License fee, \$26, re-examination fee, \$10.

Practical tests required: Insertion of an approximal gold filling with the approximating tooth in position, compound approximal amalgam filling, a silicate filling, practical test of applicant's ability in oral prophylaxis, and preparation of cavity for an inlay with wax pattern. Taking of impression, bite, selection of teeth, articulation, trial plate. Soldering of Richmond crown, which must be made from an impression of the mouth, and the articulating model with the crown, when soldered, must be submitted for inspection. Practical examination in mouth diagnosis.

Applications must be filed complete ten days before the date of the examinations. Address all communications for further particulars to

JOHN C. FORSYTH, *Sec'y*,
435 E. State st., Trenton, N. J.

North Carolina Board of Examiners.

THE next meeting of the North Carolina State Board of Dental Examiners will be held at Charlotte, N. C., beginning promptly at 9 o'clock on Thursday, January 15, 1920.

For further information and application blanks, address

F. L. HUNT, *Sec'y*,
Asheville, N. C.

South Dakota Board of Examiners.

THE next meeting of the South Dakota State Board of Dental Examiners will be held in Sioux Falls, S. D., January 7, 8, and 9, 1920, beginning promptly at 9 A.M. January 7th. All applications must be in the hands of the secretary by January 1st. Fee for examination, \$25; no reciprocity or interchange.

Full information and application blanks may be received by addressing

L. S. SPENCER, *Sec'y*,
Watertown, S. D.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING SEPTEMBER 1919.

September 2.

- No. 1,314,646, to JACOB HARTMAN and LEONARD JOY. Fountain toothbrush.
No. 1,315,041, to LEONARDO SANCHEZ. Operating mechanism for dental apparatus.
No. 1,315,088, to ISAAC BROWN. Dental attachment.

September 9.

- No. 1,315,330, to J. E. REID and F. W. SIDE. Dental switchboard unit.
No. 1,315,499, to JEPHTHA G. HOLLINGSWORTH. Dental plate cleaner.

September 16.

- No. 1,315,997, to WESLEY LINFORD SMITH. Artificial tooth.

September 23.

- No. 1,316,685, to LORWIN N. CATES. Dental tool.
No. 1,316,787, to ISIDORE GOLDMAN. Artificial tooth.
No. 1,316,807, to EDWIN A. ROSS. Dental floss holder.

September 30.

- No. 1,317,255, to JAMES H. ABBOTT. Facing for dental bridges.
No. 14,730, to THEODORE W. MAVES. Oven for burning out invested models. (Re-issue.)

THE DENTAL COSMOS

VOL. LXI.

DECEMBER 1919.

No. 12

ORIGINAL COMMUNICATIONS

Modern Tendencies in Bridge Work.

By MARCUS L. WARD, D.D.Sc., Ann Arbor, Mich.

(Read before the Dental Society of the State of New York, at its annual meeting, Syracuse, June 12 to 14, 1919.)

IT is with a peculiar sense of responsibility that one undertakes nowadays to discuss business, education, government, pleasure, or anything else, for it seems that every form of levity has given way to honest humility, utter simplicity, and directness of purpose. The relation between the subject under discussion to our achievements in the war immediately suggests itself. Popular imagination, as reflected in the public statements of responsible officials and other leaders of thought, anticipates something along the line of reconstruction from about every essayist today. Every individual and every organization has had a program for helping to win the war. In the aggregate, these programs have involved necessities, the things that had to be done regardless of personal feelings.

Assuming that the dental profession is no exception to this condition, it may perhaps be an opportune time to discuss the various methods in bridge work, for

there is probably no branch of dental work that requires greater will-power to properly execute than does the average bridge. If, therefore, the great mass of dentists have reached a condition where they are able to place what many patients need regardless of what their personal feelings may be in the matter, bridge work will have been benefited by the war.

Scores of patients have come under my observation who were rapidly reaching the stage where bridge work was out of the question because the family dentist was trained during a period in dentistry when it was thought that what nature gave to man should never be mutilated. The teeth which would have to be used to form the natural abutments for a bridge were perhaps perfect, or nearly so, and to in any way mar their beauty has appeared to such dentists as a professional crime. Lack of will-power to do anything which is against former teaching, against personal feel-

ings, against the patient's inclinations, has kept many dentists from doing what modern practice demands, and it is to be hoped that the great lessons of the war in doing things which are right, even though they hurt, will have their effect upon some of the timid ones in the profession who are doing little bridge work.

Whatever you may think about the severity of this criticism of a large percentage of the profession, and whatever conclusions you may reach by a careful study of the question, you must admit that there is a fairly widespread something, call it what you will, that keeps many men from doing bridge work. The truth of the matter in such instances is that many men are afraid to do bridge work. Afraid of what? you may ask. One says, "I can never bring myself to a place where I can cut into a perfectly good tooth for the sake of replacing a tooth or two." Another says, "I have so much trouble with my bridges breaking." Another, "I am through devitalizing teeth for the sake of bridges"—apparently unwilling to recognize the many successful live-tooth attachments that have been worked out. Another tells us, "I have seen so much pyorrhea around banded teeth that I hesitate to do much bridge work"—apparently unaware that in many instances it is unnecessary to employ bands. Another remarks that "Bridges, especially fixed ones, are a menace to the life of the patient." And another has seen cements under crowns that had become so disintegrated that the crowns were very unsanitary.

In practically all such instances trouble has been encountered, and as a result the first thought is to *refrain from doing bridge work rather than make an effort to improve the defective features and retain the good ones*. The busy men especially are afraid of trouble, and are often slow in learning whether the thing which has been troubling them has not been corrected by someone else. Through the efforts of some of the fearless and ingenious ones in the profession there have been made some very marked improvements in practically every phase

of bridge work, and it is to these improvements that the writer will direct your attention, with the hope that those who are afraid to do bridge work will resume their efforts to place the right kind of a bridge in the right place, rather than refrain from doing bridge work.

To try to place the right kind of bridge in the right place may be a significant statement to those of you who have been in the midst of a few who seem to believe that there is only one kind of bridge work that is worthy of consideration. (It is significant because it implies that there are several kinds of bridge work that are acceptable. Before proceeding with the discussion of some of the changes in the modern practice of bridge work, it should be understood that the writer believes that an effort to do justice to a general practice with only one type of such work is as nonsensical as to try to serve the best interests of a general practice with one filling material, one type of surgical operation, one procedure in orthodontia, one in prosthodontia, one method of handling pyorrhea, or one way to treat pulps of teeth. There should be no such thing in the mind of an advanced thinker as the best type or form of bridge work to apply. The thought that should be foremost in the mind of such a man is to have such a variety of types so thoroughly mastered that he is able to apply the one which seems most suitable for the case in question, and in many instances to combine two or more types, in order that the maximum of service may be rendered and the minimum of undesirable features presented. Just as an influx of people from other shores, without regard to ideals, literacy, or nationality results in a heterogeneity of stock and ideals which makes it difficult, if not impossible, to attain a unified national consciousness, so does the admission of the sons of the merchant, tailor, baker, railroad man, lawyer, minister, banker, to a course in dentistry with certificates of graduation from accredited high schools result in the graduation of a class with a heterogeneity of ideals and ability. So long

as there are variations in ideals and ability it is useless to urge the profession to the use of one kind of bridge work, or to expect various kinds to be executed with the same degree of perfection. We must therefore be tolerant of the zealot who sees no good in anything other than that which he is doing, and aim to select the good from his work and discard the poor part of it.

THE GOLD SHELL CROWN.

Among the first types of crowns that were used individually and for bridge abutments was the gold shell. For many years it was used merely as a covering for a tooth, with little success in duplicating contour, contact, or occlusion. It was formed from a band made of a piece of sheet gold, upon which was soldered a swaged cusp or cusps made from a die-plate. Such a restoration prevented further caries, furnished some additional occluding surface, and was not likely to be destroyed even with the most severe usage. The objections to it were lack of proper contour, which is necessary to deflect the excursions of the food during mastication from the free margin of the gingiva, and the practical impossibility of even the most skilled dentists reproducing the occluding surface and approximal contact that nature demanded. Notwithstanding the fact that the objections nearly counterbalanced the good features, the shell crown saved thousands of teeth.

Through the efforts of some of our ingenious men another type of gold crown was designed, known as the natural-bite seamless crown, which more nearly met the demands made on this type of crown. This type differed from the former one by being constructed from a model of the proposed crown made from a copper or nickel-silver band which, after being fitted to the root of a tooth, had placed over it a compound that would remain plastic long enough to enable the patient to make an impression of the occluding teeth in it. This band, with the carving compound in place, was then removed and trimmed

to resemble, as nearly as the case would permit, the original tooth. A fusible alloy mold was then made from this model, into which was swaged a gold shell or thimble, the result being a fairly accurate reproduction of the model. This type of crown in the hands of skilled workmen was an improvement over the older type in buccal and lingual contour and occlusion.

With the introduction of the casting process came another type of gold crown. This is made by making a band of gold for the root, upon which is placed a plate of gold. This plain shell, which is intended to reproduce the dimensions of the cervix of the tooth, is covered only with casting wax, and placed upon the tooth for the patient to make an impression of the occluding teeth in it. This rough model is then removed and trimmed to resemble as nearly as possible the tooth that nature intended for the place. The model is then invested, and the wax portion reproduced in gold in the usual manner. This cast cusp or cast crown is an improvement over the former swaged crown in sharpness of sulci reproduction, and in buccal and lingual contour in the very short cases.

All three types of the gold crown mentioned have the objection that they have a band around the root, which when properly fitted, made as thin as possible, and retained with a good antiseptic cement, while not very hard on some teeth, is quite so on others. With the exception of the color, the third improvement in the type of gold crown within the last fifteen years comes very near to the demands of the most exacting both as an individual restoration and as a bridge abutment on posterior teeth. The objection to the band has been almost entirely overcome in many cases by those who are skilled in this work, and who are familiar with our present cements. In order to eliminate the objection to the band that exists in some cases and yet retain the advantages of the gold crown much experimental work is in progress, with promise of good results.

Many of us have attempted the construction of a gold crown without a band,

but until recently little progress was made in being able to produce anything that was applicable to the great variety of cases that are present in a large practice or clinic. As we have mastered the compound gold inlay, however, we have ventured into new fields, fortified by pleasant experiences with the Carmichael attachment in selected cases. Step by step we have applied the principle of the Carmichael attachment to bridge work through the casting process, and are apparently coming to the conclusion that a full gold crown is not necessary for attachments for short bridges when the tooth used as an abutment is in a normal or nearly normal condition at the beginning of the construction of the bridge. When it is necessary to construct an entire gold crown to insure against fracture of the root, our present mastery of the casting process will enable us to do so without a band on many of the less complicated cases. Between the partial crown and the full crown with a shoulder, we are therefore able to reduce the objections to a band to a very small number.

DR. OTTOLENGUI'S VIEWS WITH REGARD
TO THE SHELL CROWN AND FIXED
BRIDGE WORK.

From this discussion we might well draw the conclusion that the gold crown of fifteen years ago has been improved beyond identification, and is now not the shapeless, tissue-irritating thing that it is credited with being by some. Many of you may be in the same attitude of mind as the editor of *Dental Items of Interest* was when he wrote the editorial for the April issue, but if you are, it is because you are afraid to tackle the problem and convince yourselves, or are not masters of the casting process, or are indifferent to the progress that is being made.

The following is taken from the editorial referred to above. Referring to Hunter's work he says:

He probably did not mean to intimate that an aseptic crown or an aseptic bridge cannot be made, but rather that such accomplishment is seldom seen. And in this he was correct.

The degradation of dentistry then lies in the fact that since the warning by Hunter we have not mended our ways. The identical methods of crown and bridge work which have resulted in such disasters are still taught in our dental schools, practiced in our dental offices, and made a part of the examination requirements of dental examining boards.

The artist-dentist who is capable of making a perfect-fitting and perfectly occluding and perfectly aseptic gold crown, loudly protests that gold crowns are permissible. Well, so they are, when made by that type of artizan. But of all the gold crowns cemented into mouths of unsuspecting patients, what proportion are safe and sanitary?

During the war, when the Government was endeavoring to conserve the precious metals, it was computed that the dental profession had used \$7,000,000 worth of gold in one year, and that no less than \$1,000,000 had been consumed in the manufacture of ready-made gold crowns. Just think of that, ye respected and respectable men in the profession! A million dollars' worth of bad practice done annually in the name of dentistry! Of course, the cry will go up that the ready-made crown can be made safe and sanitary, if proper methods be used. Granting this, which is most doubtful, let us honestly answer this question: "How many ready-made shell gold crowns placed in the human mouth are fitted and adjusted in a safe and sanitary manner?" Also let us answer this other question, "How many men who use ready-made gold crowns are capable of properly treating and filling the roots of the teeth that are thus crowned?" "How many use the shell crown on teeth that should be filled, because crowning is easier and more remunerative, and how many of that type of dentist can or do make the roots safe and sanitary before sealing over the root contents with a dome of gold, thus making the apex of the root the only point of exit for any septic material that may have been left in the root?"

This arraignment of the shell gold crown applies equally to fixed bridge work, meaning the common, and let us say commonest, type of fixed bridge work. There may be a few men who at least construct fixed bridge work in a workmanlike and more or less cleansable manner, but honesty will compel us to admit that these men, when all are counted, will not alter our first figures, which stated that 80 per cent. of crown and bridge work is septic dentistry.

From the use of the words "is seldom seen" and "there may be a few men,"

it would seem that Dr. Ottolengui is doubtful about the advisability of using gold crowns or fixed bridge work, and I have no doubt that many of you are of much the same opinion, especially if you are situated as Dr. Ottolengui is. The worst cases are sure to go to the roentgenologist first, and the result is usually that crowns and fixed bridge work are condemned, rather than the man who constructed them. I have no doubt that the condition which is described by Dr. Ottolengui is true in some places, but I invite him to show that it is true in all sections of this country, or that it exists at all in the practices of some of our best students of the casting process and fixed bridge work.

Much the same comment might be made about the use of the so-called Richmond crown, with its various modifications, that has been so generally used as a bridge attachment as has been made about the gold crown. It has in many instances been a ridiculous substitute for a natural tooth, but the men who construct them now, rather than the crown, should receive the major part of the condemnation.

The existence of the old type of Richmond crown, with its straight band surrounded by inflamed gingiva, is no longer necessary, and the man who is responsible for such work today is generally pessimistic about crown and bridge work, is afraid to attack the problem, is negligent or indifferent, or is not master of the casting process.

It makes little difference whether we are to consider crowns as abutments for fixed or removable bridges—for, in the aggregate, the same objections and same commendations apply to both. In order, therefore, that I may give you the principal reasons for my optimism about the future of bridge work, I shall endeavor to attract your attention to the three following changes that are being made in the practice of some men in this country, who are not afraid to attack any problem, are ingenious, and very progressive, and shall defer a lengthy discussion of the merits and demerits of fixed and removable work:

(1) Reduction in the number of full crowns used.

(2) As a result of this a much smaller number of teeth are devitalized.

(3) Cements which are antiseptic are used for the retention of crowns and bridges.

The illustrations which will now be presented will show how we have been able to reduce to a very large extent the number of crowns used. (See Figs. 1, 2, 3, 4, 5, and 6.)

FIXED BRIDGE WORK.

It will be obvious that the curtailment of the use of crowns applies almost entirely to individual crowns and fixed bridge work, for it is imperative that the pulps of the teeth be removed and whole crowns used when some of our best attachments for removable bridge work are used. This does not affect the discussion, however, for the number of cases demanding removable bridge work is comparatively small in the practice of one who has been in constant contact with one who realized the responsibility placed upon him by recent investigations, is a good student of oral hygiene, and who has once learned to construct modern fixed work.

Since the writer was a student under Peeso in 1906 he has used that work to a high degree of satisfaction in many cases. I have used two other methods of constructing attachments with some degree of satisfaction, but since I have been closely associated with students such as those referred to, I am convinced more and more firmly that a removable bridge is uncalled for, and may be much more unsanitary for the twenty-three hours and thirty minutes of the day that it is in the mouth than a good fixed one is when retained with a good copper cement. When such cases as those shown in Figs. 13, 16, 18, 19, and 20 present themselves, fixed bridge work is of course out of the question, and we are at once confronted with the necessity for devitalization and the use of crowns unless we desire to defer for a while the construc-

tion of a good removable bridge by the use of the cast clasp for an attachment. to do with the pulps of teeth, it may be interesting to note what some of us have

FIG. 1.



FIG. 2.

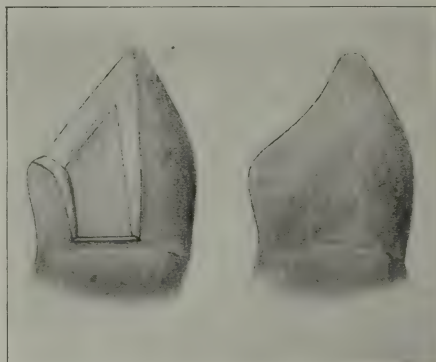


FIG. 3.

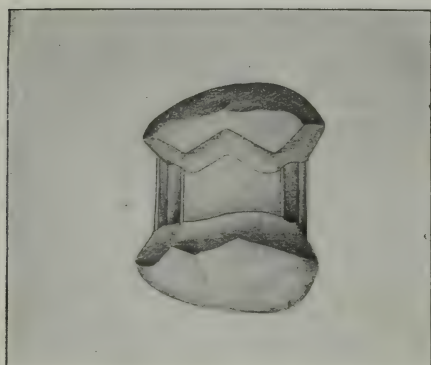


FIG. 4.

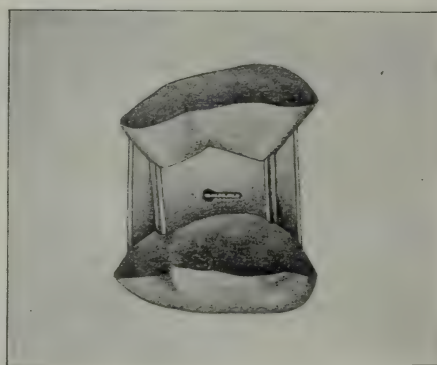


FIG. 5.

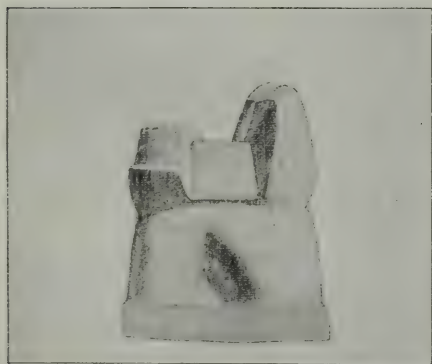
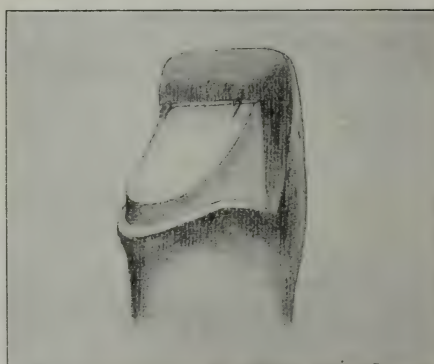


FIG. 6.

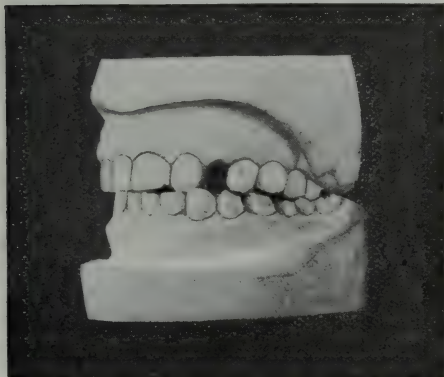


In connection with modern tendencies in the phase of bridge work which has said with respect to this matter in the past few years. Some of the earliest

attempts at bridge work were made by using open-face crowns for attachments to vital teeth. These perhaps served

days when our cements were not only lacking in antiseptic properties, but were pervious and comparatively soluble.

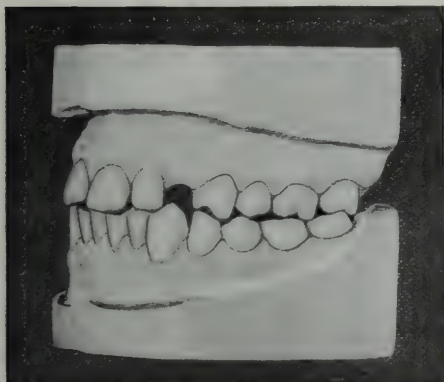
FIG. 7.



Corrected by use of inlay attachments. Teeth vital. Age 22.

very well in some instances, but more often they were the direct cause of the early loss of the roots upon which they were placed. During the time that they

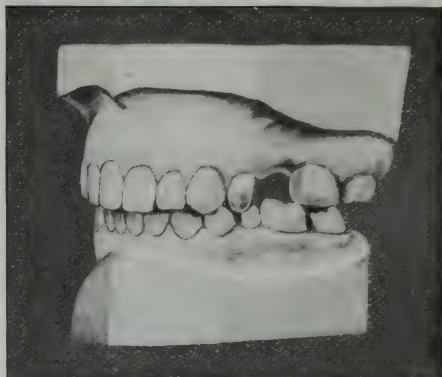
FIG. 8.



Corrected by use of inlay attachments. Teeth vital. Age 19.

were acting as attachments for bridges they were usually the source of discomfort to the patient on account of gingival irritation, and were undoubtedly an excellent harbor for infection in the

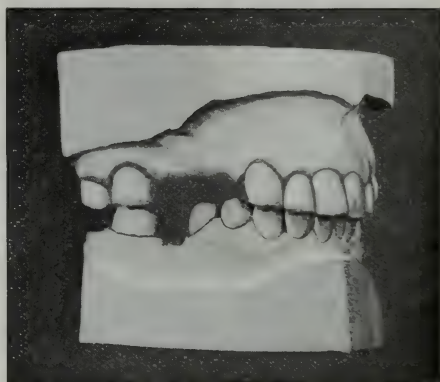
FIG. 9.



Corrected by use of inlay attachments. Teeth vital. Age 40.

The observations of many of us in those days were such as to lead us to believe that the principal objection to the open-face crown was much the same as

FIG. 10.



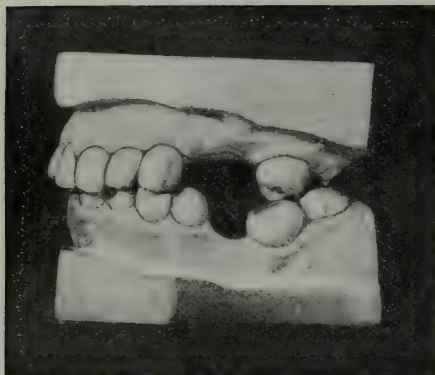
Corrected by use of inlay attachments. Teeth vital. Age 40.

had been raised to the use of the full shell crown, viz, it irritated the gingiva. Later observations led us to believe that neither of these crowns irritated the gingiva very much in many cases if the par-

tial or full crown properly fitted the root, and more recent observations have

average vital tooth, and this caused many of us to devitalize teeth upon which we

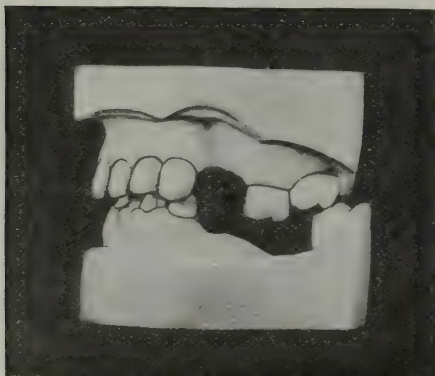
FIG. 11.



Upper corrected by use of inlay attachment in cuspid and three-quarter crown on molar. Lower corrected by use of three-quarter crowns. Teeth vital. Age 35.

caused us to add, if the cement is a modern one.

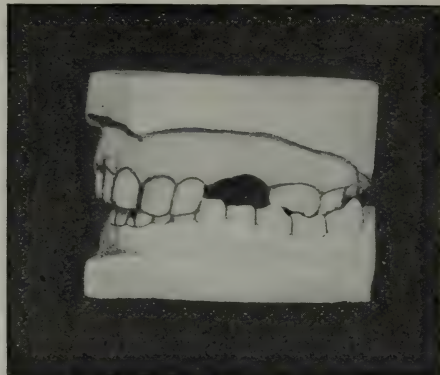
FIG. 12.



Upper corrected by use of three-quarter crown on vital cuspid and shell crown on devitalized molar. Lower corrected with removable bridge by use of split pins and tubes. Teeth devitalized. Age 35.

Some of the profession's finest technicians have recorded their inability to make a properly fitting band upon the

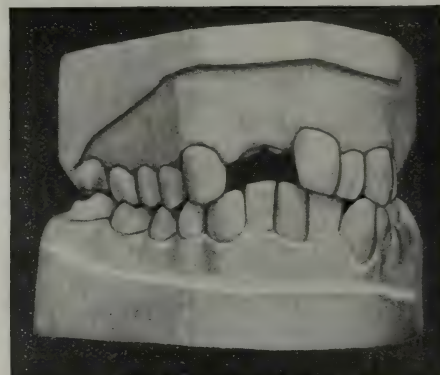
FIG. 13.



Corrected with removable bridge by use of split pins and tubes in lateral incisor and telescope crown on molar, on account of excessive resorption and crossing of bite. Age 28.

were to place crowns or partial crowns, in the belief that the factor of most vital importance was to make the band fit

FIG. 14.



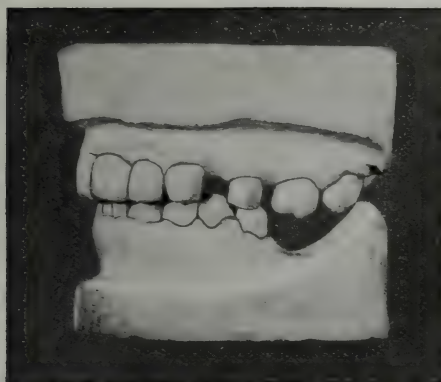
Corrected by use of three-quarter crowns. Vital teeth. Age 38.

the root. Like many other methods of practice, the pendulum swung too far, and we suddenly came to a realization that altogether too many teeth were

being devitalized for the sake of making bands fit.

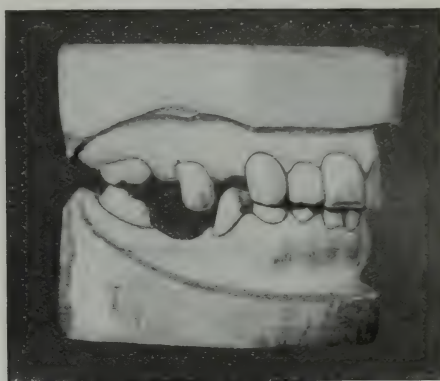
are forced to consider the after-effects of devitalization, and ask ourselves the

FIG. 15.



Upper corrected by use of inlay attachments. Vital teeth. Lower corrected with removable bridge by use of split pins and tubes. Teeth devitalized. Age 22.

FIG. 17.



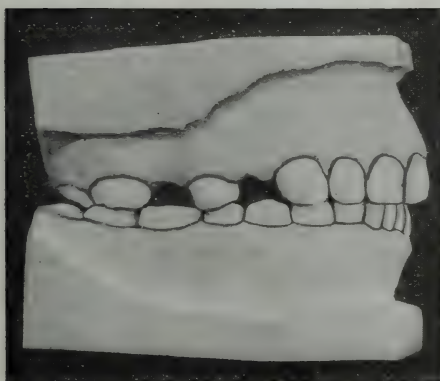
Corrected by use of removable bridges in both upper and lower by use of split pins and tubes in devitalized bicuspid teeth. Molars not used. Age 22.

DEVITALIZED TEETH AND SYSTEMIC DISORDERS.

Since we have had the responsibility of the lives of patients placed upon us

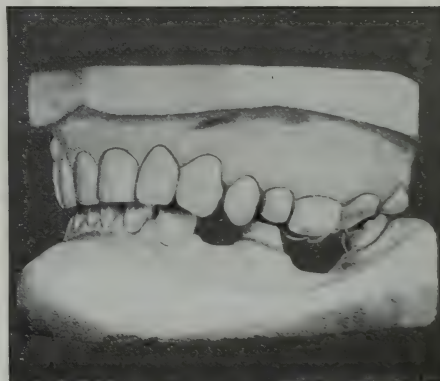
question, "Shall I devitalize this or that tooth, when the records show that in the hands of skilled men a high percentage

FIG. 16.



Corrected by use of three-quarter crown on vital cuspid, three-quarter crown on devitalized bicuspid, and support in inlay in molar. Age 27.

FIG. 18.



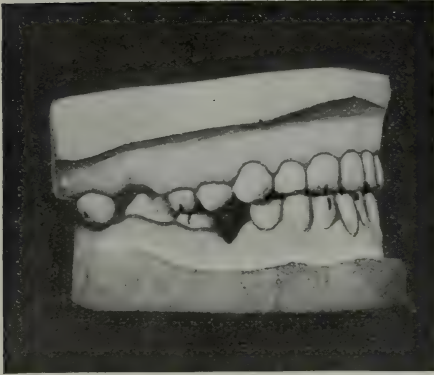
Corrected with removable bridge by use of split pins and tubes in left and right bicuspid teeth, using lingual bar. Age 24.

where we formerly had merely the responsibility for the teeth of patients, we

of systemic infections follows?" It is unnecessary for me to enumerate the chain of systemic disorders which fol-

low devitalization and imperfect filling of the roots of teeth. You are all fam-

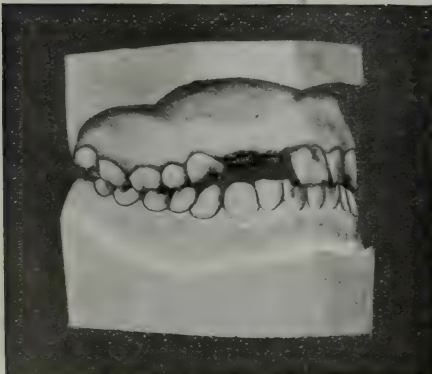
FIG. 19.



Upper corrected by use of removable bridge using pin and tube attachment in upper right second bicuspid and upper left second bicuspid with over arch bar and support for distal end of saddle in upper right molar. Bicuspid devitalized, molar vital.

Lower corrected by cast gold jackets on lower right molar and bicuspid with bicuspid dummy extended. Molar devitalized, bicuspid vital. Age 20.

FIG. 20.



Corrected with removable bridge by use of clasp attachments. Age 20.

iliar with them. You have had reports from men of unquestioned ability. You have seen the results with your own eyes.

The question which all must answer sooner or later, then, is—"Shall I continue to devitalize teeth for the sake of making bands fit, and for the sake of placing a removable bridge, which so often requires the removal of the pulps of teeth, or shall I devitalize only such teeth as there is an excellent chance of my filling properly, and which seem to be really necessary?"

This presents an entirely different situation than existed about ten years ago, when we were recording ourselves in favor of the removal of the pulps of teeth so that we might make bands fit better and prevent partial or whole obstruction of the root-canals through pulp degenerations.

The writer is one of those who quoted Rhein, Broomell, Bunting, Goslee, Peeso, Grieves, and others on the matter of devitalization for the first time in 1911, and on several occasions since. I used the following quotation in 1911* in support of my contention that whenever crowns were to be used, the teeth upon which they were to be placed should be first devitalized:

In the DENTAL COSMOS for April 1910, Dr. I. N. Broomell presented an article entitled, "The Adventitious Effect of Large Masses of Gold in Contact with Tooth Tissues." He says, "Ever since the introduction of crown and bridge work into the dental profession there has been more or less discussion in regard to the deleterious effect of large masses of gold in contact or nearly in contact with vital tooth tissues. Some operators have contended that no bad results would follow such operations, while others have been equally confident that the good offices of the supporting teeth would be naturally interfered with by completely or partially boxing them in with gold.

The former class, true to their convictions, have not hesitated to attach large or small bridges to vital teeth either by partial or entire gold caps, while the latter class have invariably devitalized the pulp before performing similar operations.

Clinical experience in general in regard to the ultimate effect of these operations has been such that deductions widely at variance have been arrived at. We have all had cases

* Dental Summary, June 1911, pp. 449, 450.

in which the vitality of the pulp has been lost in the course of time under partial or full gold caps; likewise we have all had many cases in which under similar conditions the pulps have remained *apparently* undisturbed. In view of what it is proposed to relate in this paper, the qualifying word in the foregoing sentence cannot be too forcibly emphasized, that is, the pulps are *apparently* undisturbed.

As a result of the microscopic study of a number of cases it is proposed to show that almost invariably the pulp tissue, and as well the enamel, dentin, and alveolo-dental membrane, are all more or less affected in various ways by such unnatural surroundings. Among the morbid effects produced are hyperemia of the pulp, dry gangrene of the pulp, calcification of the pulp tissue, sclerosis of the bloodvessels of the pulp, atrophy of the pulp, pulp nodules, secondary dentin, expansion of the dentinal tubules, with corresponding bulging of the dentinal fibers, pathologic pigmentation of the enamel and dentin, non-carious destruction of the enamel, as well as destruction by caries and perhaps a molecular change in this tissue.

I have no doubt that the conditions described by Broomell existed, and I am of the opinion that the practice of devitalizing teeth upon which full crowns are to be placed is good practice in many cases whenever it becomes really necessary to crown teeth and the tooth is one in which the root-canal can be properly filled. I am delighted to be able to say at this time, however, that while I have not reduced the number of restorations known as bridge work, I have reduced to a very marked degree the number of teeth upon which I place full crowns, and as a result have reduced to the same degree the number of teeth that I devitalize.

I also quoted Grieves as follows:

Pulp devitalization and clean root surgery without damage to the vital apical cementum and the peridental membrane are the very foundations upon which modern operative dentistry is reared. While it may not seem desirable in perfectly normal teeth, the question resolves itself into, first, whether we *can* do clean root surgery, and if we *can*, next, whether a few pulps are to be balanced in value to the whole human economy, as against the masticating powers of a larger bridge.

I used the following quotation from Hart J. Goslee:

For years no special thought was given to this feature, and such teeth as seemed to indicate restoration by crowning were treated much in the same manner as though fillings were to be inserted. The frequency of troublesome manifestations, however, including the ultimate death of pulps with the attending consequences of such pathological conditions as virulent peridental inflammations and alveolar abscesses, have since caused the subject to be more carefully considered, until it is now most generally conceded to be a safer precaution, in a great majority of cases, to destroy the pulps as a prophylactic procedure, as well as to facilitate the necessary mechanical preparation when the crown is to entirely cover the end of the root.

At the same time I quoted Fred A. Peeso as follows:

As to the crowning of teeth with vital pulps, I think there has been a change from the early days when it was considered almost a crime to destroy the pulp, if there was any possible way of avoiding it.

I regard these quotations as quite accurate reflections of the general feeling of the bridge workers in this country in 1910-1912. The cast gold inlay and its various modifications into partial crowns were not as well established as they are at the present time and we were obliged to confine our observations to the use of the gold crown and the open-face crown in many places where we would not apply them at this time.

Among the first to discuss the situation as it exists today was Hartzell (*Dental Review*, February 1916), who said:

It is absolutely true that the pulpless tooth has been made to suffer for many sins for which it is not of itself responsible. . . . I am not surprised that there are a considerable number of my fellow practitioners who are willing to jump to the conclusion that the train of evil events growing out of infection about teeth is not chargeable to any neglect of ours, and go calmly on practicing the same type of dental surgery that we have always practiced, quietly failing to charge the evil results of infection to their proper source.

In another part of the same paper he continues as follows:

The methods of dentistry are at the present time hanging in the balance. When heart, arterial, kidney and joint infections are absolutely proven to proceed in many instances from infection originating in the dental path, you may rest assured that medicine and surgery will demand of us, as they are demanding of themselves, efficient precaution against infection and successful treatment of preventable infection. Therefore our question, What shall we do with the pulpless tooth? assumes an importance worthy the consideration of us all.

First and foremost, Is the sterile well-filled tooth a menace? My answer to that question is most emphatically, No. However, the pulpless tooth of the future must be handled by vastly different methods than the methods of the past, to escape condemnation. We as a profession will have to unite in greater effort than we have hitherto put forth to maintain dentistry on its present high level, by giving to the care of the pulpless tooth or the tooth to be devitalized hours of time where in the past we have slurred it over with little consideration. To accurately remove the pulp, where removal is possible, and fill and protect the root-canals of a molar means the work oftentimes of two or three hours, and to remove a root-filling from an imperfectly filled root and purify and refill the canals may involve double that expenditure of time. The question which confronts us as practitioners in the question of the pulpless tooth is, Are we willing to educate our patients to the need of this work, and do it in such a manner as to protect them from serious damage? If we are not, then we must squarely face the issue, which is extraction for all that type of case in which the misfortune of decay has exposed the pulp to infection. For that other type of case, in which bridge work must be placed, we are confronted by the necessity for applying bridges to our teeth in such a manner that the pulps may be preserved. The placing of bridges upon teeth containing living pulps versus the placing of bridges and crowns upon teeth from which pulps have been removed is attracting much attention, and much can be said on both sides of that question. I here present for your study a common example, in which a crown has been placed upon a vital tooth, which subsequently died, and I wish to say in this connection that some of the worst cases of infection that it has been my fortune

to see in the dental clinic and private practice have resulted from the death of teeth which were not devitalized previous to crowning.

There are three interesting statements in the quotation from Hartzell, as follows: (1) "We are confronted by the necessity of applying bridges to our teeth in such a manner that the pulps may be preserved." (2) "Some of the worst cases of infection that it has been my fortune to see in the dental clinic and private practice have resulted from the death of teeth which were not devitalized previous to crowning." (3) "The placing of bridges upon teeth containing living pulps versus the placing of bridges and crowns upon teeth from which pulps have been removed is attracting much attention, and much may be said on both sides of that question."

These statements are especially interesting to me, for they indicate a tendency toward a new epoch in dentistry, in which we must take into consideration some things that previously we had thought unimportant before we devitalize a tooth for the sake of applying one of our pet mechanical devices. You may say that you can fill the roots of teeth so that they will not become sources of infection, which may be true if you carefully select the cases and adopt the best methods of technique we have today; but I say to you in all sincerity that the greatest evil is not in the practices of those of you who can do this, but in the practices of those who cannot do it, or are indifferent to the problem confronting them.

There are various degrees of skill, intelligence, and ideals in the dental profession, as in other professions, which is evidence enough that root-canals will not always be filled as they should be. If we are satisfied that we cannot get this work done in a satisfactory manner by many, and if we can find satisfactory substitutes for that work which requires devitalization, it appears to me that the first step for those of us to take who have been recorded on the subject of devitalization is to openly, and at once,

record our change of mind brought about by the advance of the profession.

REMOVABLE BRIDGE WORK.

I take this opportunity to record myself as saying that from now on the chances for infection at either the apex or cervix of the roots of teeth shall be the first thing considered when I am consulted about bridge work. Much as I would like to place a good removable bridge in the mouth of some patients from the standpoint of mastication, and sometimes appearance, I shall have to be shown that what I am to accomplish for the patient must completely overbalance the destruction to the teeth necessary to place the bridge, which often increases the liability to both apical and cervical infection.

Much the same should be said with respect to fixed bridge work, whether it be of the inlay or full crown attachment type. We should in my opinion adopt what appears to be a more modern tendency, viz, cut down the number of full crowns and thereby cut down the number of devitalizations, even if we are obliged to cut down the amount of both fixed and removable bridge work. I anticipate a query from some of you about the difference between some of the inlay and partial crown attachments presented for fixed work and the condemned open-face crown and full crown regardless of its type. You may ask, Do the pulps not die under such attachments, and is there not the same type of degeneration going on in the pulps of teeth with these attachments on them? Apparently, no. One thing is certain, we do not have cervical irritation and attending infection from this type of attachment.

The difference between this type of attachment and the gold and amalgam fillings referred to by Broomell and others in causing degenerative changes in the pulps of teeth seems to be quite marked, probably due to the quantity and nature of the cements that are in contact with tooth tissue.

THE RÔLE OF CEMENTS IN THE CAUSE OF CERVICAL INFECTIONS.

Another phase of bridge work that has recently come to my attention is that of cervical infections. During the last four or five years the attention of the profession has been centered largely about the foci of infection at the apices of the roots of the teeth, and little or nothing has been said about the infection about the necks of the teeth that has resulted from ill-adapted bands, unfinished fillings, and poor cements. My attention was drawn to the connection between cervical and apical infections through efforts of some of our clinical men to remove apical infections with crowns on the teeth. In some of these instances little or no progress was made so long as the crown remained on the tooth. The case would then be presented to me, and after an unsuccessful attempt to remove the apical infection by treatment, both therapeutical and surgical, I resorted to removal of the crown or bridge which was on the root. In a large number of these cases the infection would apparently be eliminated soon after the removal of the crown or bridge. I have had to handle two or three cases within the last year where patients have come to the clinic with a cane and were unfortunate victims of the use of digitalis. The most recent case was one that had seven cast base crowns which had been poorly fitted to the roots. Roentgenograms showed that all the roots had been devitalized, but poorly filled. It appeared, however, that the roots were well filled with secondary dentin, making it quite probable that we would not be very successful in filling them to their apices. In this case we simply removed the seven crowns, sealed the roots, bathed them with iodine and waited ten days. In the meantime the patient had almost completely recovered.

In another case, quite recent, the patient was in the hospital with heart trouble as the result of four gold crowns, two of which had been put on lower second molars and two on lower bicus-

pids. The bicuspid were well filled, as shown by the roentgenograms, and the second molars appeared to be fairly well filled, with secondary dentin. Removal of these crowns and the same treatment of the roots as was given in the previous case brought about almost complete recovery within a few days. These observations have led me to examine at once the cervixes of the roots of teeth before attempting to remove infection at their apices.

The question that may be well asked is whether or not a poor grade of mechanical work or the cements were the cause.

gained by the use of antiseptic cements in the retention of all crowns which come in contact with the gum tissue. This led me to undertake a study of the copper cements, two or three years ago. Following the work that I did on copper cements, in 1914-15 (see *Journal National Dental Association*, 1915, and *Dental Review*, 1916), the manufacturers of dental cements have conducted some very high-grade research in their efforts to get cements that were impervious, insoluble, adhesive, and antiseptic.

The chart shown will give some idea of the changes that have been made from

CEMENT POWDER = ZINC OXID (ZnO)

MODIFIED BY

1. Heating or Nitration. (Practiced by all manufacturers.)
2. Fineness of Comminution. (Practiced by all manufacturers.)
3. Addition of Other Compounds—
 - (a) To improve properties Bi_2O_3 . (Used by Caulk, Ames, Smith, and Fleck.
 MgO . (Used by Caulk, Smith, and Fleck.)
 - (b) To color the powder MnO_2 (black).
 Fe_2O_3 (red).
 - (c) To add antiseptic properties .. CuO (black). Ames 99%. Caulk 25%.
 Cu_2O (red). Fleck 25%. Caulk 8%.
 Cu_2I_2 (white). Caulk 2%.
 CuSiO (white). Smith 2%.
 AgCl (white). S. S. White 2%.
 Ag_3PO_4 (gray). S. S. White 2%.

Further observations have led me to believe that a well-adapted band or a well-finished filling will not produce an unsanitary condition as quickly as one that is poorly adapted or poorly finished. There can be no doubt, I believe, that in cases where there is a poor adaptation there will be trouble regardless of what cement is used, but I believe that if a thoroughly antiseptic cement has been used, even with a poorly adapted band, the case will not become unsanitary for a very long time, if at all.

I should dislike very much to create the impression that the bad effects of a poorly fitted band may be overcome by the use of an antiseptic cement. I believe, however, that a great deal may be

a plain phosphoric acid and zinc oxid cement to our present products. It may be noted from the chart and from a review of the current literature that bitter controversy has been waged over the proper degree of germicidal efficiency, and how to determine the same. The group of products shown under sub-heading *c* represent varying percentages and compounds of copper and silver that have been introduced to make products that were primarily antiseptic, though at the same time possessing many of the qualities of the zinc oxid cements. By referring to the article in the *Dental Review* mentioned above, my views on how to determine the antiseptic property of these cements may be obtained. My

views on the percentage of copper that is necessary to maintain a reasonably antiseptic condition may be also had from this article.

Clinical experience since this work was done has been supplemented by further work in the laboratory, until I have come to the firm conviction that a good, strong, antiseptic cement should be used in all cases where the band is applied, or when any other piece of work comes in contact with the gum tissue, if there is a likelihood that there will be the slightest crevice between the tooth and the piece of work inserted. The question that has been asked by many practitioners since the article referred to was published, has been, Which of the cements do you recommend, and are the light copper cements of any value? I have to say in anticipation of some such questions today, that I have practically eliminated the light copper cements from practice for the present, and have adopted those copper compounds which contain more copper than do the light

cements. It should be understood that the present light copper cements do not contain more than 2 per cent. copper, and if this percentage were to be increased very much, they would immediately pass over into the darker ones. If they have passed over into the darker cements, it makes little difference whether the percentage is then 5, 8, 10, 25, or 100.

In our practice at the present time we are using almost exclusively the red and black copper cements and the cuprous iodid product in the form of copper zinc for all forms of crowns. In the cases that look to be difficult to be kept clean, we are adopting the jet-black one made by Ames and Caulk, and the red ones by Fleck and Caulk. In cases where a decidedly red or black color would be objectionable, we are using the copper-zinc product, about equal parts of copper and zinc with crown and bridge powder.

[See also *Discussion*, as reported under "Proceedings of Societies," this issue.]

Oral Foci of Infection from a Dentist's Standpoint.

By H. H. SCHUHMANN, M.D., D.D.S., Chicago, Ill.

THE question of oral foci of infection is by no means a new one. It has been thoroughly discussed by many writers until it has almost become trite. Nevertheless, in spite of all this discussion, the wide difference of opinion that exists upon this subject is appalling, and does not prevail in any other branches of medicine. What is there that hinders us from arriving at some mutual understanding on this subject? The answer to this question lies in the fact that for years there has been something radically wrong in the instruction received in pathology, and in the great lack of instruction in bacteriology in our colleges.

As long as we possess limited information and entertain narrow points of view, it is hardly to be expected that we shall arrive at a scientific conclusion on this important subject. The number of physicians and dentists who are satisfied in making an empirical diagnosis is gradually decreasing, for they have learned that such a diagnosis is generally wrong, with the result that the treatment is usually disappointing in its result.

Not many years ago we gave very little thought to the etiology of, for example, pyorrhea alveolaris. Today we assign a number of causes to this condition. Some of these etiological factors are well

known to all of you—chronic irritation due to tartar, decay, and defective work, unsanitary conditions about the mouth, with resultant lodgment and putrefaction of food particles, constitutional and metabolic reactions, faulty articulation, and bacterial or parasitic causes. The organisms generally found in this condition are the various members of the streptococcic group, spirochetes, and fusiform bacilli often found in typical cases of Vincent's angina, also many types of putrefactive bacilli, amœbæ, etc. The micro-organisms present in septic pockets about the teeth are very numerous; especially in examining the superficial pus in pyorrhea pockets do we find a great number of the above-named bacteria. By wiping away the superficial discharge and making a direct smear or a culture of the deeper accumulations we find streptococci and staphylococci predominating, the streptococci often being present in pure culture, usually as the *streptococcus viridans*.

While it is very unlikely that any of these organisms are the specific causative agents, it is generally agreed that most of them may be pathogenic, and under suitable conditions are capable of producing acute and chronic inflammation. It is of greatest importance always to trace focal infection and not merely to make a snapshot empirical diagnosis, ascribing the difficulty to some dental trouble, just because such a point of view happens to be the prevailing and fashionable viewpoint at the present time. It is needless to state the utter worthlessness of any such diagnoses made without all the substantiating evidence obtainable from laboratory findings. One must constantly remember that it is unlikely that any of the organisms mentioned ever cause local or systemic infections unless at the same time there is some existing abnormal condition present which diminishes the resistance to the invading organism.

In all questions involving infection it is necessary to take into consideration the fact that while various organisms, according to Vaughan of Ann Arbor, have their individual toxins which may

be more or less harmful, all organisms have one common toxin, namely, their albumose constituents, the latter being largely contained even in organisms of a saprophytic nature, and secondly, the entire potentialities of the body must be taken into account, for they all come into play. It is therefore fallacious to confine one's investigations to a limited sphere without giving due consideration to the entire body forces. In studying these cases it is essential to avail oneself of all scientific knowledge and laboratory research. It is just as wrong to belong to the ultra-conservative group who look upon this as a passing fad, as it is to belong to the over-zealous class who run every idea to the ground, simply because the opinions of both groups are based upon insufficient experimental and scientific facts. It is proper at this time to approach these studies with an open mind, always on the alert for new and substantiated facts, and continually guarding against unwarranted generalizations and conclusions, or conclusions obtained through ultra-scientific investigations leaving out of consideration, as we frequently are apt to, the natural sequences of life's principles.

WHAT CONSTITUTES A FOCAL INFECTION.

We may define a focal infection as a circumscribed lesion of a bacterial nature, later resulting in infection of a contiguous or noncontiguous part by the same bacteria or their toxins. From this definition it is clear that even if the presence of bacteria in a circumscribed area is demonstrated, that of itself by no means constitutes a focus of infection. It is an old-established fact that bacteria may be present for long periods of time without creating bodily infection at all, and without even producing any local symptoms. For example, the organisms of diphtheria, pneumonia, spinal meningitis, and many others are frequently carried about for great lengths of time by perfectly healthy people, who are entirely ignorant of the fact that they harbor organisms of such a highly infectious nature. Whether this peculiar condi-

tion is due to the organisms present being in such a state of virulence that they are harmless, or are walled off, or that the host does not seem to be in a receptive state for their ill-effects, or that reaction factors in their surrounding media or any other of the many preventive factors, matters not. One thing we must admit, namely, that these organisms, although present in the patients, do *not* necessarily cause local or systemic disturbances, and do *not* constitute foci of infection. Failure to recognize these facts will inevitably lead to much misdirected effort and to disappointing treatment.

Should an oral focus of infection actually be demonstrated, then there are two other factors that come into play before the host will suffer from constitutional derangements of any kind, namely, the bacteria or their toxins must enter the blood stream, and the local area to become infected secondarily must be in such a state of lowered resistive power that it will receive the organisms or their toxins, and permit of the further propagation of the bacteria, together with a possibility of their virulent faculties to develop. In other words, there must be a *locus minoris resistentia*. The presence of bacteria somewhere in the oral structure, with a synchronous appearance of arthritis or endocarditis, is by no means any evidence that one is due to the other. It is true that under proper auspices an alveolar infection might produce endocarditis, but let us not overlook the fact that alveolar infections are frequently present in the young, particularly in the children of poor districts; it nevertheless is but comparatively rare that we find these children suffering from endocarditis. It would seem, therefore, that to definitely associate endocarditis, or for that matter arthritis, *always* with dental foci of infection is at least very debatable.

About a year ago, after some rabbits had been injected with streptococcus viridans obtained from human alveolar infections, it was reported that in all cases and by virtue of peculiar selective characteristics of the organisms, the latter had attacked the serous and synovial mem-

branes of these animals, all of them showing arthritis and endocarditis. The attempt was made thereby to prove that the streptococci contained in granulomata at the root ends of teeth had a very definite bearing on sequential results, namely, endocarditis and arthritis. These experiments have been widely discussed by men who lack scientific training, and who accepted the statements as facts. In these experiments it is endeavored to prove the constant selectivity of organisms; it is claimed that when organisms are obtained from such locations as human tooth granulomata and abscesses at the apices of teeth, their introduction into the ear vein of rabbits invariably is followed by attacks by these organisms on the synovial membranes of such animals, and that this shows their tissue selectivity for this particular tissue. Such findings, however, do not prove any such fact. It has since been found that *any* organisms introduced in such manner attack the synovial membranes, producing arthritis and endocarditis, including streptococci viridans and others obtained from perfectly healthy human mouths. Evidently it is not the selective action of organisms which produces these results, but it is the fact that these particular tissues are very vulnerable to such attacks by any organisms; not a chemotactic process between the organism and the tissue cells at all. Many investigators have repeatedly proven the fallacy of the selective factor, and have demonstrated the same end results, namely, arthritis and endocarditis in rabbits, by injections of bland chemicals and, as has been shown by Professor Rufus of New York, even by the introduction of plain egg albumen. Furthermore, we all know that rabbits are particularly susceptible to the activities of streptococci, just as other animals show particular susceptibility to other organisms, as, for instance, the white mouse to the pneumococcus.

Rheumatism has for a long time been ascribed by the medical profession at different periods to different organisms, and at present the etiologic factor seems to be commonly accepted to be a strep-

Staphylococcus viridans. The name "rheumatism" describes a complex of symptoms, such as arthritic disturbances, changes of temperature and involvement of the serous membranes, including that of the endocardium. The more definite information which we are obtaining from bacteriologic laboratories tends to show that some different forms of arthritis are due to specific organisms, for example, such as is found in gonorrheal arthritis, in typhoid, and diphtheritic arthritis. These are classes of arthritis which certainly do *not* depend for their etiology on streptococcus infections derived from oral foci, and as time progresses no doubt various other forms of arthritis will in their name be linked to proper specific organisms. It is therefore clear that all cases of arthritis are by no means due to the streptococcus viridans, and certainly not to those only found in oral infection.

An infection, as we have previously stated, is a morbid bacterial process in which the organisms or their toxins have found their way into the blood stream, and by a process of dissemination have established similar bacterial seats of infection in tissues, either contiguous or non-contiguous. It would seem, however, that when we speak of infections we usually refer to the absorption of bacteria, and only seldom refer to what is at least as important, namely, toxemia due to the general toxin contained in all organisms. Evidently the dividing line between endo- and exo-toxins cannot be drawn too definitely. Toxemia refers to the absorption of bacterial poison. It is not necessary, therefore, for a secondary infection to take place that bacteria be transferred from one situation to another, but the harmful results may be due to their general toxin or albumose constituent. This also is equally true of saprophytic organisms. Organisms may do their harm directly to the tissues, or their toxins may so hinder the defensive powers of the body as to permit or invite the future attacks of organisms from a different source altogether.

The entire surrounding media of the

hormones of the internal glands may thus be changed by the results of toxic infection, and as our antibody production is in large measure dependent upon the proper activity of these hormones, it may be much decreased by such effects. These toxins do not necessarily have to come from oral foci of infection, as there are many other sites of possible foci of infection which may produce just such toxins. This may account for some of the obscure cases of arthritis which are produced by albumose poisons lowering the resistive power of the serous and synovial membranes, so that bacterial invasion from the same or from still another source is invited.

Naturally, deep-seated infections and general sepsis must have their cause in some localized infection somewhere in the body. The same is true of general toxemia. We might mention aside from the dental regions, however, many others—such as otitis media, pyelitis, tubercular processes, intestinal disturbances (digestive chemical errors, anaphylactic disturbances)—all of which may be due to some other local process or to a toxemia indirectly responsible, and due to some other local infection.

There are so many angles to this question that it seems astonishing so much emphasis should have been put on *dental* infections, when in reality, if we consider these in particular they should, according to all scientific reasoning, be even less apt to be the etiologic seat of the secondary infections for which they are usually blamed. This is even more particularly emphasized in small granulomata at the end of a tooth root; after osteoclastic bone destruction we find bacteria contained in thick fibrous granulation tissue surrounded for months and sometimes for years by their own offal, with very little fresh nutrient material, almost entirely walled off. We also know very little about the fluid content as regards alkalinity or the glycogen content, data which are of the greatest importance if the virility of the organism is to be considered. Our knowledge of the virility of the organisms as to their power

to traverse the thick envelopes of fibrous tissue is also very limited. If it is a fact that these organisms are really pathogenic or in a pathogenic state due to their specific toxin, and are constantly and slowly piercing the fibrous wall and gaining access to the blood stream, would we not, by such frequent gradual infiltrations, be justified in the belief that such an osmosis would tend to produce a high degree of tolerance? Inasmuch as this gradual invasion of bacteria would act much the same as the very best sort of vaccine, it has been demonstrated that at times bacteria actually are located in the small peripheral capillaries of the granulomata, and thus may gain entrance to the general circulation. As you see, there are a great many vital questions to be considered, but to follow blindly new theories without investigation should not be the road for the scientifically developed mind to travel. There are many other avenues of secondary infection which are rarely thought of; for instance, such as the results of infection from eruptive fevers. If it is finally and definitely determined that the source of a morbid state lies in a certain focus of infection, then let it be our duty and also that of the physician to locate that source, and not ascribe it to a certain locality merely because the prevailing idea happens to be to ascribe most diseases to a bacterial infection from a certain localized area. In the young, tonsillar and middle-ear infections surely play a great rôle in the general status of health, and there again the mere presence of organisms is in no wise proof that these situations are the sites of focal infection. We find in children frequently, and in adults also for that matter, at times a large increase in colon bacilli. Does that mean a focus of infection? No, it is even desirable that these colon bacilli be present in their proper location. We know that middle-ear infections may be present for a long time without causing the slightest local or constitutional trouble. Thus streptococci and diphtheria bacilli, as well as a large number of other pathogenic organ-

isms, may be present for weeks and even years without causing any ill-effects.

TWO WIDELY DIFFERENT SOURCES OF ORAL INFECTION.

It would seem to the writer that in order to arrive at some sane method of approach to the scientific investigation of the factor of oral infection and its consequences, we are obliged to view the matter from two widely different avenues of bacterial location. These are, namely, the one a filth condition about the teeth caused by unhygienic neglect, or even in mouths that have received better care but as a result of pyorrheal infection have become septic; in other words, an *infectious area practically open* and filled with toxins from which the bacterial infection can easily spread to adjacent tissues, such as the tonsils, naso-pharynx and alimentary tract, readily causing invasion of bacteria with consequential bacterial and albumose poisoning. And the other, that condition found at times where bacteria are supposed to be in granulomatous tissue about the apices of devitalized teeth, and this again, in the writer's opinion, should be definitely subdivided into two classes, namely, one showing a very slight area of radio-translucency, which may simply denote osteoclastic bone destruction, as demonstrated so beautifully by Eugene Talbot of Chicago, without any infection at all, and the other a large area of that sort less distinct in outline, which latter, to the writer's mind, would indicate a *definitely spreading invasive infection of a pathogenic nature*. And in this category the writer would include those spreading infections which at times are seen reaching into the antrum or into the inferior dental canal, these unquestionably being dangerous seats of infection, and should be looked upon as such.

As far as the writer's *clinical* observation goes, he is forced to admit that the greatest number of those spontaneous cures with which he has become acquainted were achieved by prophylactic

treatment or extraction of such teeth as are enumerated in the first category, where secondary infection resulting from the local filth condition has followed, and where the infection has occurred on the basis of a toxemia due to albumose poisoning. But he has found that in other cases, where only devitalized root apices with small radio-translucent areas were supposed to be at fault, usually very little benefit followed either extraction or treatment. Where the larger radio-translucent areas were found, extraction and proper curetment should naturally always be followed by beneficial results.

RADIO-TRANSLUCENT AREAS NOT NECESSARILY INFECTIOUS AREAS.

Considered from a bacteriologic or biologic viewpoint, the writer is at this time not at all convinced that these areas commonly called infected (speaking of the smaller radio-translucent areas) merely because they show radio-translucency are invariably infectious, or that organisms of harmful influence are even present. These radio-translucent areas on X-ray films may be produced by many agencies other than bacteria. For instance, by the use of arsenical applications to a pulp, or the introduction of coagulating substances, such as formaldehyd; these may easily coagulate the lymph in the lymph spaces about the root ends, and produce this radio-translucency without meaning an infection at all. In fact, it has been shown by Talbot that osteoclastic destructions may result from any kind of irritation, and produce radio-translucent areas.

Further, the method by which the harmful bacterial invasion would necessarily have to take place from these granulomata is one which the writer is not ready to completely admit at this time, even though it may be possible that the peripheral small capillary circulation of the granulomatous tissue may simulate an anastomosis with small vessels of the bone circulation.

True, we do hear of spontaneous bene-

ficial results from tooth extraction in many suspected cases, but the writer has seen also many instances in which teeth were removed without any constitutional benefit whatever following such procedure, or where the beneficial results were only of a temporary nature. If cases are presented where oral foci of infection are actually shown to be the cause of the secondary infection, or where all other possible sources of infection have been excluded, and only as a matter of last resort these suspected areas are to be removed by extraction of the teeth suspected, then let it be understood that the mere removal of the teeth, followed by a slight scarification with a curet, is not at all sufficient to produce the desired results. The operation in such instance must be concluded by vigorous surgical interference, such as properly cutting away all diseased bone and all granulomatous tissue that may have been suspected to be present through the X-ray examination. This, however, by no means indicates that such radical surgical procedure should be resorted to in ordinary cases of an extraction. Many of the so-called granulomata which ordinarily are the cause of removal of many teeth can and have been treated, with the result that later pictures showed these areas completely healed, or on the way to being completely healed. The ruthless unscientific extraction of teeth is entirely inadvisable, in the estimation of the writer. Much oftener beneficial clinical results have been obtained in the cleaning up of superficial infections, such as are found in unclean mouths, which are due to neglect or to pyorrhea, by simple prophylactic measures than are found as the result of extraction after diagnosis of probable root infection, the X-ray showing small, well-defined radio-translucent areas. I am reminded of a case under observation at the present time, where a woman of about thirty-five years of age and suffering from arthritis was advised to undergo dental prophylactic treatment. A blood examination before treatment showed the following:

Erythrocytes	4,500,000
Leucocytes	11,500
Hemoglobin	0.9
Color index	1
Polymorphonuclear	56
Small mononuclear	38
Large mononuclear	4
Transitional	0
Eosinophiles	2
Basophiles	0

Red cells normal in shape and size. Stain well.

After treatment, results were as follows:

Erythrocytes	5,300,000
Leucocytes	6400
Hemoglobin	100
Color index	1
Polymorphonuclear	65%
Small mononuclear	33%
Large mononuclear	1%
Transitional	1%
Eosinophiles	0

This woman had her teeth radiographed, and no less than eight were found with small radio-translucent areas. But notwithstanding the fact that she *only received ordinary local prophylactic* treatment, and that *nothing* whatever, up to the present at least, has been done to overcome any possible infection from the so-called granulomata, her improvement in the examination, as far as blood differential was concerned, you will readily see was certainly striking, in fact, is now almost normal, and I fail to see that any further great improvement along that line is to be expected following the subsequent treatment of these root apices. Her arthritic condition was vastly improved. This is one of those cases where possibly the rheumatism may have been due to oral sepsis; not

to any particular organism, not to any apical infectious foci, but to a general albumose poisoning. The writer believes that in such cases a low-grade poisoning of albumose is established, and the activities of anti-body production are so hindered as to allow deleterious bodily influences to work havoc without any direct microbial infection spreading from the original source of disease. This toxemia being removed allows the bodily functions to return to normal, and the disappearance of arthritic symptoms might readily be expected to follow.

A sequential disease should be traced to its proper source in a thoroughly scientific manner before pronouncing the final diagnosis.

It should also be determined as to which of the two infections was first present. A synchronous existence of two disturbances does in no way prove that one was dependent on the other; they may both or either one have been caused by a third bacterium or toxin, and may therefore be entirely independent occurrences. Notwithstanding the fact that many infections are produced by oral focal infections, the underlying principles are not entirely clear. There is no question in the mind of the writer that many secondary infections have as their etiologic factor oral foci of infection, but he feels at the present time that the underlying principles are not fully scientifically established, and that therefore our conclusions should be drawn carefully and only after thorough scientific investigation of all the factors having a bearing on the case.

We are all seeking the truth, and that can only be obtained by true scientific study, entirely unbiased by mere prevailing opinions.

25 EAST WASHINGTON ST.

Radicalism.

By F. C. BRUSH, D.D.S., New York City.

A RETROSPECTIVE view of the contents of dental journals of the past few years leads to the conclusion that dentistry has not been exempt from the infection of radicalism that seems to have tainted our whole social structure. Instead of finding carefully considered and conservative statements as expressed by the leaders of the past, we find the most radical views voiced with positive assurance by men whose chief claim to fame lies in the ability to talk upon any subject at any and all times.

Not infrequently we come across the statement made or implied that unless some particular method of procedure is adopted forthwith one will be liable to the charge of malpractice. In fact, malpractice seems to have become a word of quite common usage, not only at dental meetings but in conversations with patients and the general public. This has had an effect that might have been expected, even if not desired, for insurance men say that suits for malpractice are increasing rapidly, and the time has almost come when a man cannot be said to have arrived in the profession unless he has had one or more such suits to defend.

The insurance men also say that upon investigation it is generally found that the reason for the bringing of the suit can be traced to the psychological effect of some unwise statement or accusation made by some follower of these radical talkers.

THE DANGER OF DEVITALIZED TEETH EXAGGERATED.

The prevailing idea that non-vital teeth are the initial cause of about all of

the "ills that flesh is heir to" must certainly be classed as a radical one. The wholesale devastation that is following in its wake is appalling to men of calmer judgment. Now that a little time has elapsed, giving a better perspective, and results can be checked up, it appears that devitalized teeth which have been treated, the canals filled to and through the apex, by methods that are being so insistently heralded these days, do not show a far different percentage of successes and failures than those which were handled with an equal amount of care and filled by some of the older methods.

Probably every dentist who has been long in practice and has kept detailed records can recall numerous cases where teeth that have been devitalized and treated years ago, according to methods then in vogue, have gone for years without showing the slightest symptom of disease, having to all intents and purposes fulfilled their functions in a sufficiently healthy manner, and many of them still remain in this condition.

Such records will also reveal instances where teeth that have been treated in a like manner have remained for years in a satisfactory condition, without showing any symptoms that would arouse suspicion that all was not well, and then suddenly, without apparent cause, have developed an acute alveolar abscess. I say without apparent cause for this reason: Dentists as a rule confine themselves strictly to their own field and seldom investigate the general condition of the patient, and at such a time, for the purpose of seeking a possible exciting cause in some other portion of the body, the need of a thorough physical examination has not been thought of or at least practiced.

The point of the matter is, if it is possible for bacteria to be carried in the blood stream from the apex of a tooth to some other part of the body and there set up a local disturbance, as is now being claimed, is it not equally possible for the same blood stream to convey bacteria from some remotely situated diseased tissue to the apex of a tooth whose resistance has been lowered by the loss of its vitality, and there cause an acute abscess to develop? In other words, may it not be possible that an abscess at the apex of the root of such a tooth might be an effect due to a diseased condition elsewhere, rather than being the exciting cause of the physical condition? How else can we account for phenomena that are familiar to all of us?

The usual experience has been that an infection makes its presence known almost as soon as it occurs. Is it reasonable, therefore, to suppose that a tooth which is infected will remain apparently healthy and quiescent for years before suddenly developing an abscess? When an abscess does occur, after a long period of evident health, is it not reasonable to suspect that the infection may have been contributed from some other diseased tissue? Consider the Roosevelt case, for instance. When it was boldly announced that his illness and death were due to an abscessed tooth of twenty years' standing, the public mind was ready to accept such a tale, and it made a good theme for a *Ladies' Home Journal* story.

If some of the facts in the case are investigated, however, it will be found that Mr. Roosevelt had indulged to excess in violent physical exercise nearly all his life; that in the Santiago campaign he contracted Cuban fever, and that for years he suffered from recurrent attacks (spoken of frequently in letters to his children); that long after he had passed middle life he took up Japanese wrestling, and his muscles were severely strained and his body badly bruised; that on his African hunting trip he was bitten by tropical insects, and his diary at the time records that day after day he suffered from fever; that

on his journey into the Brazilian wilderness he was again bitten by poisonous insects and contracted jungle fever (from which a white man seldom recovers), at the same time undergoing deprivation and violent physical exertion. He returned home broken in health, and was a constant sufferer in one way or another from that time on. Boils and abscesses occurred at various times; sciatic rheumatism developed, and several operations were undergone. Some months before his death he was told that he would probably have to spend his days confined to a chair. And when the call came, in his sleep, it was an embolism that was the immediate cause of his death. Yet in spite of all this there are some so bold as to declare that his illness and death were due to an abscessed tooth.

THE UNCERTAINTY OF THE RADIOGRAPH.

Concerning the X-ray and the wonderful tales it is supposed to tell about hidden conditions. It is quite possible to play tricks on the X-ray and the expert who claims to interpret the radiographs. To do so is both amusing and instructive, but it tends to shake one's faith somewhat in both of them. How is it that a dark area or shadow about the apex of a tooth is almost invariably interpreted as an abscess, or an infected area, even when there are no other symptoms to corroborate it, when teeth that are known to be unquestionably abscessed will sometimes show a clear normal condition in the radiograph? That devitalized teeth with empty canals will be interpreted as being vital teeth? That canals which are filled with various kinds of dressings will be reported as being left unfilled? When a radiograph shows a dark area supposedly indicative of tissue destruction, can the expert honestly say whether it is or was an abscess, basing his judgment on the mere evidence of the radiograph alone?

A case taken at random from my records: A crowned upper canine was radiographed by an expert, who diagnosed the trouble as an abscess and recommended apicoectomy. A careful examination

with a probe revealed that the root was split its entire length, and when the tooth was extracted there was no sign of an abscess.

Another case: The expert radiographer at a prominent medical institution made a diagnosis of a large abscess involving the area around two teeth, and was rather insistent that an operation should be performed almost immediately. However, it was merely necessary to remove the two artificial teeth, and the suspected abscess disappeared. Had the patient mentioned to the expert the presence of the artificial teeth a ridiculous mistake might have been avoided. Such mistakes would be good jokes if it were not for the serious psychological effects upon susceptible people.

There are any number of cases where apparently healthy teeth have been radiographed and the negative has shown shadows or dark areas about the roots, yet when these same teeth, twenty-four or forty-eight hours later, have again been radiographed from a slightly different angle, the negative has not shown even a trace of a shadow. To have operated on such a tooth on the mere evidence of the first radiograph would be radicalism; better judgment would deem it unwise to condemn such a tooth until more definite evidence could be obtained.

The foregoing remarks are not made with any intention of disparaging the real value of the X-ray as an aid in diagnosis, but rather to show that it is unwise to take too much for granted or to make snap judgments; in other words, not to be too radical. The wonder lies not in how much some of us know, but in how much we know that is not so.

Another common source of trouble is when some amateur radiographer takes a radiograph of a root with a doweled crown. The dowel, extending part way in the canal, will stand out boldly and clearly in the negative, which is shown the patient. While explaining the details a more or less casual remark is made that the canal has not been filled to the apex, that such a condition may prove detrimental to the health, together with a veiled allusion to malpractice.

If the patient happens to be one of those whose chief indoor sport is starting suits for damages, some one is more than likely to have such a suit to defend. Having been led to believe that the X-ray tells the whole truth and nothing but the truth, it would be hard to convince the patient or a jury that the tooth had been properly cared for in a conservative way, and in a manner that was seemingly for the best interests of the patient, all things being considered.

Disputes of this kind not only engender hard feelings between members of the profession, but also tend to cause the public to lose confidence in and to question the honesty and ability of medical men in general. It is altogether too common a practice nowadays for physicians to take radiographs of the teeth, pass judgment, and order extractions, without consulting with a dentist about the case. This procedure is just about as radical as it would be for a dentist to order an operation on some other part of the body in the hope of relieving a condition manifested in the mouth.

Recently there have come to my attention the cases of five women who have undergone the operation for complete hysterectomy. Each one is complaining of painful knee-joints accompanied with stiffness and considerable enlargement. One of them followed the advice of a physician and had a number of teeth extracted, without any apparent improvement in her condition. Another, before following similar advice, consulted a dentist; the teeth and other tissues of the mouth were found in a normal condition. Another has a normal mouth with no non-vital teeth. I cannot say as to the condition of the mouths of the remaining two.

What is to be inferred from cases like these? Is it merely a coincidence that all of them have the same symptoms under the same bodily conditions? May it not be possible that the complete removal of one function has necessitated a readjustment which has manifested itself by this local disturbance in the knee-joints? If so, would it not be a little less radical to consider and investi-

gate this possibility before ruthlessly sacrificing inoffensive teeth?

All this goes to show that what is most to be desired is less radicalism and a good deal more plain reasoning and common sense on the part of dentists,

with closer co-operation between them and physicians if the best interests of patients are to be served and confidence in the professions is to be restored to anything like its old position.

17 E. 38TH ST.

A Practicable Root-canal Technique.*

I: Introduction.

By ARTHUR B. CRANE, D.D.S., Washington, D. C.

IN view of the divergence of opinion of the acknowledged leaders of dental thought, there prevails in the average mind an uncertainty as to the efficiency of any method of dealing with pulpless teeth. While the medical profession in general contemplates with scepticism the attempts to retain non-vital teeth *in situ*, the natural repugnance of most patients to submit to the mutilation of extraction places the burden of responsibility squarely upon the dentist.

The happy day may come when universal prophylaxis will practically eliminate the necessity for root-canal work, but the dentist of today must be prepared to render intelligent service to patients with diseases of the dental pulp. He must elect either to extract at once all teeth with exposed or non-vital pulps and absolutely avoid devitalization, or he must develop his root-canal technique to a point which will insure the patient, to a reasonable degree, against future extraction.

The claim that no infected tooth can be retained with safety is as absurd as the attempt to save all teeth. There are men in every part of the country who can present an avalanche of roentgeno-

graphic and clinical evidence of bone regeneration in periapical areas previously infected. The writer and others have determined by occasional cultural tests through the alveolus that such regenerated areas are commonly sterile.

The question, then, is not one of feasibility but ability, and the reason dentists generally are not making such teeth safe is because they will not devote the infinite attention to detail which this work demands.

Whoever has followed the progress of root-canal technique during the past few years must be gratified by the tendency toward standardization of methods among the recognized leaders. In spite of occasional diatribes against the wisdom of retaining non-vital teeth, the writer believes that the problem of a satisfactory root-canal therapy is nearing a solution. Although the hopelessness of the reorganization of pathological periapical areas can be logically set forth, the fact remains that actual cures are being daily effected. The pages of surgical history are illumined by the narration of the overcoming of other seemingly insurmountable difficulties.

In 1552, at the siege of Danvillers a

* [This is the first instalment of a series of articles on this subject by the author, which will minutely detail an efficient method of treating and filling root-canals and performing the operation of root resection.—Ed.]

shot passed through the tent of M. de Rohan, and hit the leg of one of his retainers. One of the most famous surgeons of all time finished cutting it off, to the wrath of his contemporaries, refusing to use either the red-hot irons or the boiling oil, then considered indispensable. Paré was ridiculed, but the simple treatment of wounds and the ligation of arteries which he taught, with slight modifications, are fundamental to the surgery of today.

In 1864, sepsis following surgical operations was considered inevitable. In defiance of all tradition, Lister by scientific deduction evolved the true theory of anti-sepsis. The wise men of the times who prided themselves upon the number of old blood stains on their operating coats condemned his work as dangerous procedure, but to the great underlying truth of his theories is due the aseptic surgery of today.

In 1915, in France, a wounded soldier is brought into a hospital. A wound in the leg, suppurating, contused, full of bits of shrapnel, dirt and pieces of clothing, has caused an alarming elevation of temperature. Logical surgical tradition would call for the amputation of this leg, but thanks to the scientific bravery of Carrel, in a few weeks this man is back on the firing line.

Before Paré, the treatment of gunshot wounds without the use of hot oil and hot iron was impossible; before Lister, deliberate surgical operations without subsequent sepsis intervening were impossible; before Carrel, the closure of a suppurating wound in four days was impossible.

Perhaps in dentistry, also, the seemingly impossible may be accomplished. The treatment of periapical disease may yet be placed upon such a scientific basis that none will question its expedience. Great men like Callahan may go to their graves with the condemnation and destructive criticism of the wise men ringing in their ears, but this problem will never be solved by the man who throws up his hands.

Vincent, of Carrel's group, found that

only about 30 per cent. of surgically aseptic wounds were bacteriologically aseptic. Yet thousands of soldiers who owe their lives to Carrel and Dakin would laugh to scorn the critic who condemned their treatment on that account. So while the hypercritical pro-extractionists continue to prove that it is impossible to render an infected tooth and its environs bacteriologically aseptic, perhaps we, too, may depend upon the natural resistant forces to exert the same influence in the alveolus which contributes to the cure of infections elsewhere in the body.

The object of these papers is to present in an orderly manner a complete root-canal technique which is giving a large percentage of successful results in the writer's practice. The facts and theories set forth comprise a digest of the various methods advocated by the authorities, modified and supplemented by considerable study and some original research. Much of the matter included has already been made public in papers and clinics, but it is hoped that by thus gathering together in a consecutive manner the procedures which have been most helpful to me, it may be possible for others by comparison, to clarify their own technique.

The subject will be treated in the following order: Diagnosis, Asepsis, Instrumentation of the Canal, Therapy, Bacteriology, Obliteration of the Canal, and Surgery.

It will be impossible at this time to give due credit for the many suggestions which have influenced me in arriving at this technique. Rhein, Callahan, Buckley, Coolidge, Ottolengui, Black, Prinz, Grieves, Moffitt, McLean, and a host of others are the masters to whom the reader will owe any benefit which may be derived from a perusal of these papers.

Before proceeding, let it be understood that *the writer advocates the retention of the minimum number of non-vital teeth, and then only when these are necessary to preserve an unbroken arch, or to afford retention of prosthetic appliances.*

II: Diagnosis.

The foundation principle of a practicable root-canal technique is accurate diagnosis. Diagnosis is a scientific determination or discrimination of diseases by their symptoms. It calls for a knowledge of cause and effect acquired only by a wide clinical observation. It is the embodiment of experience. Without a correct perception of conditions to be met any treatment becomes empirical.

In the management of root-canals a careful diagnosis based upon methodical examination should precede any effort at treatment. Thereby much time and useless effort may be saved, and respect for the prognosis of the dentist increased.

The diagnostic procedure should begin with a thorough physical examination. If this is properly conducted it will not only indicate suspicious teeth, but in many instances will classify those which may be expected to respond favorably to therapeutics, those whose only hope lies in surgery, and those which must be condemned to extraction.

The following conditions if found indicate the advisability of further investigation:

Color. A tooth whose shade is not in harmony with its fellows is probably the seat of a pulp lesion.

Translucence. This is commonly called the live-tooth appearance. When it is absent the pulp is probably dead. A small mouth lamp held lingually will be of great assistance in determining this point.

Large cavities. These should be carefully excavated and tested with a sharp explorer to determine proximity to the pulp chamber.

Large fillings. These are always suspicious, and should never be passed without thorough tests.

Gold crowns. Teeth under gold crowns are also always suspicious. The wonder is not that so many pulps die in such teeth, but that any survive. The reason for this is that the freshly denuded dentin is left exposed to the fluids of the mouth until the crown or inlay is set.

Infection invades the dentinal tubuli, and is sealed in to continue its activity until at last the pulp becomes infected. As a precautionary measure a mild antiseptic should be sealed in contact with exposed dentin before the patient is dismissed. Cement should be used in cavities and aluminum shells for crowns. A cement of eugenol and oxid of zinc is excellent for this purpose.

Post crowns. With rare exceptions these are placed on pulpless teeth.

Crownless teeth. These sometimes contain vital pulps, but unless treated prior to restoration will surely cause after-trouble.

TESTING THE TEETH BY MEANS OF THE ELECTRIC CURRENT.

Having marked all teeth which are suspicious by the foregoing tests, they should be further checked by means of the electric current. Either the Faradic or galvanic current may be used, the only requirement being some method of controlling the dosage. The high-frequency current is also useful in this connection, but it is more difficult to concentrate this current upon given areas of the tooth crown, and thus a faulty diagnosis may result. With any of the standard galvanic switchboards, such as are used for electrolytic medication, the test is made as follows:

A section of a broken broach is fitted into the needle holder and attached to the positive wire. The sponge electrode is soaked with salt water and held by the patient in the palm of the hand. The tip of the broach is wrapped with cotton fibers, and this also is moistened with salt water. Several teeth which are unquestionably vital are now tested, and the tolerant dosage noted. With this as a control the suspicious teeth are tested. Machat warns against touching the electrode to metal fillings or crowns, but as the resistance of sound enamel varies so much in individual teeth, it is generally satisfactory to apply the electrode to a

filling or crown where the metal does not come into contact with the soft tissues, especially where corresponding fillings or crowns on teeth of known vitality can be had as controls.

It should be borne in mind that more current is required to penetrate enamel than metallic fillings, also that crowns and inlays have an intermediary of more or less non-conductive cement, which causes these teeth to respond only to an increased dosage. Recession of the pulp or thick deposits of secondary dentin in the pulp chamber must also be taken into consideration. When the canal is filled with the liquid products of decomposition, the tooth is often quite as sensitive to electricity as if the pulp were vital, and where hyperemia of the pulp exists, the tooth will often be more sensitive than the control. For teeth in which the electro-diagnostic test is inconclusive the old-fashioned thermal tests will often be of assistance in clearing the diagnosis.

Having by the foregoing tests excluded the teeth of unquestionable vitality, the next step is a clinical examination of the periapical region. Careful search should be made for fistulæ or scars where these have healed. The discovery of such will suggest more or less destruction of periapical tissue, but there will often be as much or more disorganization where this evidence does not exist.

PERCUSSION.

The degree to which the apical attachments of the tooth have been destroyed may be judged by percussion. The so-called "dull note" of the older practitioners requires a trained ear, but has a definite value. The percussion test of Talbot is of more universal utility. This is accomplished by placing a finger of the left hand over the apex of the suspected root and striking the cusps of the tooth with a heavy instrument at different angles. If the bone has undergone destruction the vibrations will be transmitted through the root to the finger. This test is of greater value on anterior teeth than on molars; where pyorrhea exists it is utterly confusing.

To ascertain the extent to which the bony plate of the alveolar process has been destroyed, take a small hard pledget of cotton in the cotton pliers, and press hard on the mucous membrane overlying the root apex. The tissues will sink into such an opening, and slowly return when pressure is removed. The appearance is much the same as pitting of the skin by pressure in edema.

Whenever the clinical tests classify any tooth as suspicious, the patient should be carefully questioned as to its history. Some patients have extremely good memories, and almost all can remember a prolonged toothache or the swelling of the face in the region of the tooth in question.

THE X-RAY AS AN AID IN DIAGNOSIS.

With the data now in hand all teeth recorded as non-vital or suspicious should be radiographed to complete the diagnosis. Correct interpretation of dental radiographs cannot be made in the absence of good clinical data, and this point cannot be made too strong. Neither can radiographs be properly read by one deficient in the knowledge of normal dental anatomy. The density of the film, the angle from which the exposure has been made, the density of superimposed structures, and the contiguity of other anatomical formations must all be taken into consideration.

In reading a dental X-ray film, the teeth known to be normal should first be studied. (Fig. 1.) The use of a good reading-glass, or denticscope, will be of great help. It will be noted in the case of a normal tooth that the pericementum can be traced around the root as a continuous radiolucent line. Adjacent to and surrounding this will be seen the lamina dura or radiopaque line. It will also be noted that the trabeculæ of bone about the apex are homogeneous with the bone which lies adjoining.

Infection is microscopical, and cannot be radiographed. What we look for in the film is not infection, but the results of infection. Thus it may happen that a tooth recently infected or one long the

habitat of organisms of low virulence may present a radiographic record in no way differing from the normal. (Fig. 2.) Again, in the entire absence

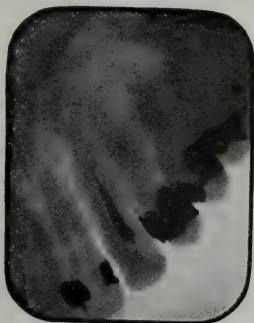
FIG. 1.



The cuspid is normal. Note the continuous line of the pericementum and the lamina dura. Also the homogeneity of the surrounding trabeculae of bone. Compare with apical regions of lateral and first bicuspid.

of infection there may be a rarefying process in the adjacent bone sufficient to cause a most decided radiolucent area. This latter picture is caused by overstimulation, as in traumatic occlusion

FIG. 2.



Infected cuspid, with no radiographic evidence of periapical disturbance. Streptococcus.

(Fig. 3) or orthodontic procedure, and may also be observed about the forming roots of adolescence. (Fig. 4.) Bearing these points in mind, the suspicious tooth should be examined to see in what manner it differs from the normal.

The first thing to look for is a thickening or break in the line of the pericementum at the apex of the root. Next the bone about the apex should be examined for radioparency or radiolucency, and the presence or absence of the lamina dura noted; then the periphery of the apex should be studied for evidence of

FIG. 3.



Radiolucent area about apex of second bicuspid, caused by traumatic occlusion. Pulp vital and normal.

roughness. When any or all of these signs are recorded in the radiograph of a tooth which the clinical examination has shown to be non-vital, we may safely conclude that the tooth is infected, and

FIG. 4.



Note radiolucent area about root apices of first molar. Pulp normal.

that we are dealing with periapical disease. Where all of these signs are absent, and the pulp is known to be contaminated or dead, the infection, if present, while confined to the root-canal and dentin, is still a constant menace to the periapical tissues.

At this point we are enabled to make

a differential diagnosis, and the tooth in question must be placed in one of the following classes:

- A. Pulp normal.
- B. Pulp exposed, but not infected (rare).
- c. Pulp exposed and infected.

FIG. 5.



Class 1.

Class 2.

Class 3.

1. Circumscribed radiolucent area (granuloma).
2. Diffuse radiolucent area (granuloma).
3. Circumscribed radioparent area (dental cyst).

- D. Pulp undergoing decomposition.
- E. Pulp non-vital, but no periapical disturbance.
- F. Pulp non-vital, with periapical disease.

has led me to the conclusion that in periapical disease we are dealing with three distinct conditions, which may in most cases be differentiated in the film. For the sake of convenience I have differentiated these conditions as follows (Fig. 5):

Class I. Circumscribed radiolucent areas. (Primary granuloma.)

Class II. Diffuse radiolucent areas. (Advanced granuloma.)

Class III. Circumscribed radioparent areas. (Dental cyst.) (Fig. 6 and Fig. 7.)

The outstanding characteristics of these three classes are as follows:

CLASS I (Fig. 6, A): CIRCUMSCRIBED RADIOLUCENT AREAS.

At first glance this may disclose no abnormality of the periapical tissues, except a slight thickening in the periapical pericementum, or it may present any extent of rarefying osteitis. There may or may not be evidence of previous attempt-at root-canal filling. This condition, in the absence of such evidence, is too frequently passed with a glance, when a more prolonged study will reveal an absence of the apical lamina dura and

FIG. 6.



Class 1.

Class 2.

Class 3.

CLASSIFICATION OF PERIAPICAL DISEASE.

A comparative study of radiographs with the actual condition of the tissues, as disclosed by numerous root-resections,

an indefinitely circumscribed area, to a varying degree more radiolucent than the surrounding bone. To fall into Class I, however, no matter what the degree of periapical disturbance, the area must be

circumscribed, with the radiolucent area blending gradually into the normal bone.

In cutting down upon these areas the

root apex. This class represents the primary results of infection, and the affected area is circumscribed, because

FIG. 7.

A



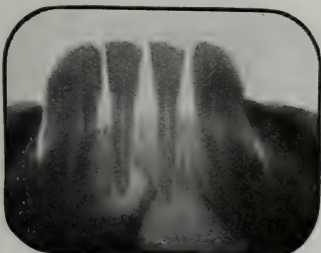
Periapical disease, class I. Note circumscribed radiolucent area about second bicuspid.

B



Periapical disease, class II. Note diffuse radiolucent area about second bicuspid.

C



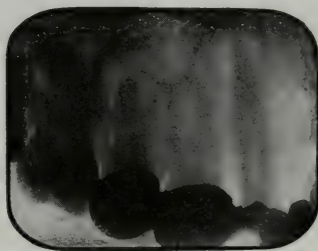
Periapical disease, class III. Note circumscribed radioparent areas, surrounded by radiopaque line. These cysts were sterile.

D



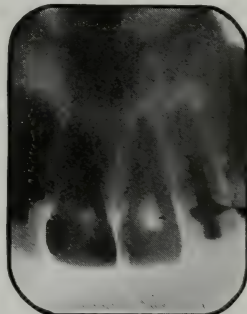
Periapical disease, class I, on mesial root; class III, on distal root, lower first molar.

E



Periapical disease, class II, on cuspid; class III, on second bicuspid.

F



Periapical disease, class I, on left central; class II, on right central; class III, on right lateral.

alveolar plate will generally be found to be intact, but behind this a mass of soft granulations will be found investing the

the vital forces, while being slowly overcome by the invading organisms, are, as it were, making an orderly retreat.

It often happens at this stage that proper root-canal treatment so attenuates the invading host that the balance of power passes to the tissues, and a cure results.

For the better understanding of the statement just made the microscopical picture of primary granuloma must be studied (Fig. 8). Under the low power may be seen a fibrous capsule surrounding a cellular central portion. Under high power the capsule is seen to be composed of dense white fibers of connective tissue, with numerous vessels and capillaries. There is a scattering of wandering tissue cells and fibroblasts. The central portion is composed of plasma cells, fibroblasts, lymphocytes, and leucocytes, lying in an indefinite stroma of embryonic connective tissue. Careful examination will reveal the capillary loops often lined with a single layer of endothelium. It is from these delicate vessels that the inflammatory cells probably have their distribution. Such a pathological arrangement is strongly indicative of nature's effort to wall off the irritant.

CLASS II (Fig. 6, B): DIFFUSE RADIO- LUCENT AREAS.

This class shows in the film an irregularity of the radiolucent area, which may vary from a simple break in limitation to an entire loss of form. As in Class I, the limitations of the abnormal area are poorly defined, and it is impossible to determine the borderline between normal and rarefied bone, so gradually does one blend into the other. The irregularity of general outline is caused by ramifications of inflammatory tissue which extend from the central mass into the surrounding bone. Wherever this abnormal tissue comes in contact with bone or cementum, disintegration of the hard tissues takes place. The cementum becomes roughened and the bone becomes softened. This condition represents the absence of the reparative effort exhibited in Class I cases, and follows neglect or improper treatment of the primary infection. While it sometimes happens that

Class II cases respond to treatment, the destructive process has reached so advanced a stage that it is seldom that teeth in this condition are restored to health, except by root resection. Indeed, the infection in this class of cases is rarely eliminated even by extraction unless extensive curetment is performed. Under the microscope the advanced granuloma shows areas of degeneration in the central mass, which appear as lumina containing fluid or cheesy matter.

CLASS III (Fig. 6, C): CIRCUMSCRIBED RADIO-PALE AREAS.

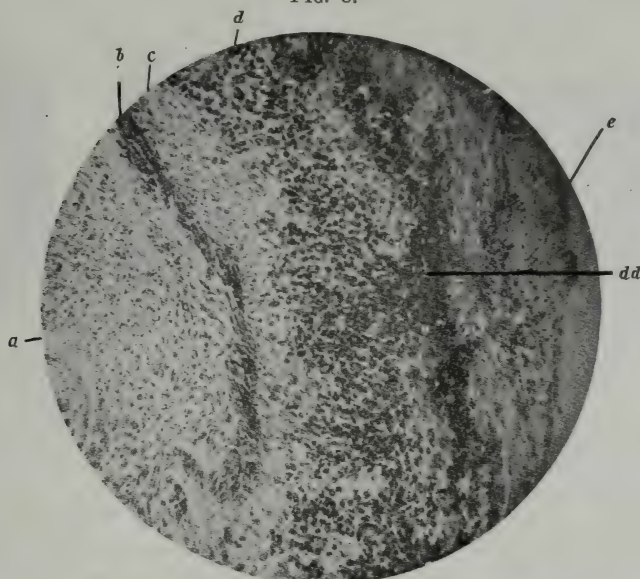
In this class the film shows an intensely dark circumscribed area surrounding the root apex. This dark area is outlined by a dense white line, which definitely separates radiopaque from normal bone. Such a picture is always indicative of a dental cyst. In cutting down on these cases, a definite cyst wall will be found attached to the root-end. By careful dissection this may be freed from its bony capsule and by resecting the root just below its attachment the whole cyst may be removed *en masse*. The limiting wall of bone, which shows in the radiograph as a dense white line, will be found to be smooth and hard. If the cyst be opened it will be found to contain a straw-colored fluid. Cysts are an expression of nature's effort to protect the organism from the baneful effects of certain noxious irritants. Microscopically the cyst wall will be seen to be formed of connective tissue fibers lined with epithelial cells. In granulomata which develop necrotic areas, epithelial strands may often be seen surrounding the necrotic area. Thus certain Class I cases go on to cyst formation, while, on the other hand, the frequency with which radicular cysts appear as a late sequel to devitalization of the pulp from traumatism, suggests the possibility that in some instances these growths are not of infectious origin.

Whether infected or not, cases of completed cyst formation as included in Class III are probably never eradicated

by treatment through the canal. The cyst wall must be entirely destroyed or the cyst will re-form.

graphic record identical with any of the foregoing classes, or in extremely rapid establishment of drainage may produce

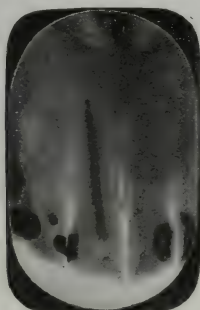
FIG. 8.



Photomicrograph of advanced granuloma. *a*. Degenerative area. *b*. Leucocytes and bacteria. *c*. Fibrinous layer. *d*. Granulation tissue. *dd*. Capillary loop. *e*. Pericementum.

A type of periapical disease not mentioned above which is frequently en-

FIG. 9.



Chronic abscess with fistulae. Note absence of periapical disturbance.

countered is alveolar abscess, either acute or chronic, with tendency to fistula formation. This may present a radio-

so little periapical destruction as to escape detection in the film. (Fig. 9.) Where an abscess exists in conjunction with Classes I, II, or III of periapical disease, it is usually caused by the secondary invasion of staphylococci pyogenes. When acute alveolar abscess does not record proliferative tissue changes in the film, it is likely to be the result of infection by the staphylococcus pyogenes, the streptococcus hemolyticus, or both.

A further important point for study in the radiograph is the condition of the root apex, and this is obviously of greater prognostic value than the condition of the surrounding bone. If the cementum is exposed and roughened it is certain that there is no present treatment by which this infected necrotic tissue can be restored to life, to say nothing of health.

Anatomical points which seem to cause the most confusion are the lower cells of

the antrum (Fig. 10), the nostrils (Fig. 11), and the anterior palatine foramen (Fig. 12) in films of the upper teeth, and the mental foramen (Fig. 13) in films of the lower. The question of infected

not be saved, but a selection of risks, through careful diagnosis, makes a favorable prognosis reasonably safe in

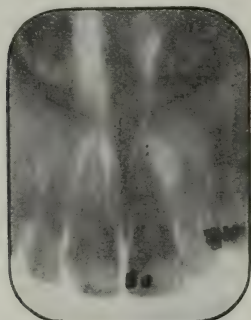
FIG. 10.



Lower cells of antrum. Trace pericementum about apex of lingual root of molar.

areas in these regions can be quickly determined by tracing the line of the pericementum around the root apex. If this is intact the dark radiolucent area cannot be caused by infection from the root-canal. Occasionally it is necessary

FIG. 11.



The nostrils superimposed upon root apices of centrals.

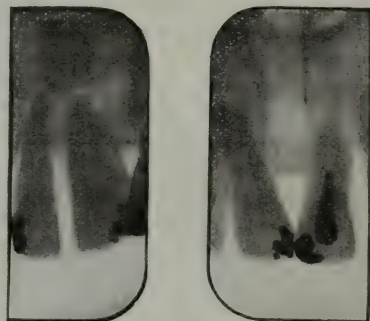
to get an exposure from a different angle to verify the reading. (Fig. 12.)

CASES IN WHICH TREATMENT THROUGH THE ROOT-CANAL IS CONTRA-INDICATED.

It may as well be acknowledged that there are many infected teeth which can-

FIG. 12.

A B



A. Anterior palatine foramen. B. Taken from further to the right than "A" clarifies the diagnosis.

many instances. For the sake of convenience, infected teeth which are rarely benefited by treatment through the canal

FIG. 13.



Mental foramen. Note termination of inferior dental canal.

may be classified in three groups as follows (Fig. 14):

Group I. Teeth having considerable dead apical cementum.

Group II. Teeth having considerable dead alveolar cementum.

Group III. Teeth having their apical opening within the maxillary sinus.

Group I. (Fig. 15.) A careful consideration of these three groups may have a tendency to prevent many unsuccessful

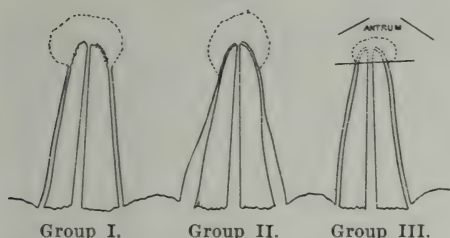
ful attempts at tooth treatment. Recalling the classification of periapical disease previously referred to, it will be realized that most cases of Class II and all cases of Class III have so much denuded and therefore dead apical cementum that they must be included in Group I. After one has extracted a number of such teeth

cal area to the gingival margin, which can often be traced out in the radiograph. Attempts to sterilize such teeth invite failure, as constant reinfection will ensue.

Group III. Teeth having their apical opening within the maxillary sinus when affected with periapical disease are of unfavorable prognosis, because in most cases of this character it is probable that an infected granulation tissue has been substituted about the root apex for the normal lining membrane of the antrum, and reinfection is almost certain to occur.

The dental X-ray film is an unreliable guide as to the relation of the tooth root and the maxillary sinus. Fortunately we have a means of physical diag-

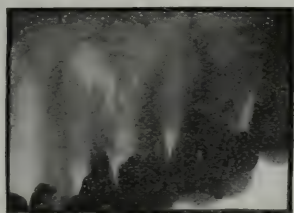
FIG. 14.



Types unfavorable for canal medication: I. Too much dead apical cementum. II. Too much dead alveolar cementum (pyorrhea). III. Canal opening within the antrum.

and curetted the periapical bone, or better still, has cut down upon them for root-resections, it requires considerable faith in the potency of antiseptics to believe that this infected field, full of dead and dying tissue, with the exposed apical cementum, which can neither be sterilized nor insulated, acting as a con-

FIG. 15.



Group 1. Too much dead apical cementum.

tinuous irritant, can ever be restored to health by treatment through the canal.

Group II (Fig. 16). Teeth having considerable dead alveolar cementum are those pulpless teeth which have pyorrhea to the extent of pocket formation. In such cases there is generally a pathway of drainage established from the periapi-

FIG. 16.



Group 2. Too much dead alveolar cementum.

nosis which is conclusive. When the pathfinder is passed through the apical foramen in certain upper bicusps and molars, there is a twinge of pain, after which the instrument moves upward without resistance or pain. This is an indication that the antrum of Highmore has been invaded.

Artificial perforation of the lateral cementum may usually be discovered by the tendency to hemorrhage, and persistent seepage. The patient can generally localize the pain as being in the gum when an instrument is passed through the perforation. Diagnostic wires are often helpful, but if the puncture is lingual, or labio-buccal, the radiograph is unreliable. If the false opening is accessible, it may at times be filled successfully. Occasionally a puncture near

the apex may be so capped with gutta-percha that it is not a source of irritation. More frequently, however, teeth so mutilated become lame, and must be extracted.

SUMMARY.

To summarize, then, we are confronted by the prospect that the only teeth which offer opportunity for favorable prognosis in root-canal treatment are those with Class I periapical disease, a very few cases in Class II, and those in which the periapical conditions are still normal.

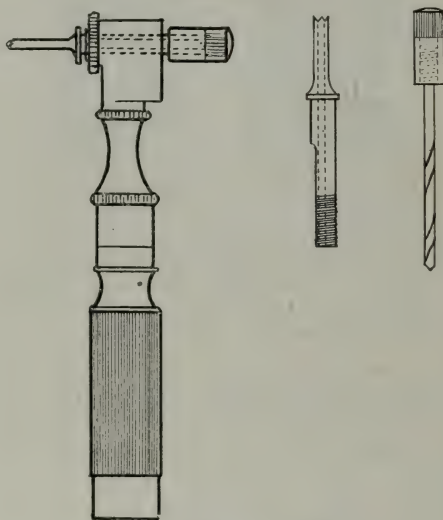
It often happens, after the most exhaustive efforts at diagnosis, that there remains an uncertainty as to the necessity for interference with certain teeth. For the most part these are teeth with partially filled canals and no evidence of periapical disturbance, or well-filled canals recently treated, which still show radiolucent bone areas about the root apex.

Until some method is advanced of determining when the apical foramina have been sealed by a new growth of cementum, any tooth with an incomplete canal filling should be considered a source of danger, no matter what the periapical condition. We must constantly bear in mind that the radiograph is but a record of macroscopical conditions, while infection is the result of a microscopical invasion.

An instrument has recently been devised by Coriell* (Fig. 17) of Baltimore, which is of the greatest value in deciding upon the necessity for treatment in these

extremely doubtful cases. This consists of a trocar-drill and cannula, so constructed that it can be used in the right angle hand-piece of the dental engine. By means of this instrument a hole may be made through the alveolus to the root apex, after which the drill may be withdrawn, leaving the cannula in place.

Fig. 17.



Coriell's trocar and cannula.

Through this an uncontaminated culture may be taken, which will definitely determine the bacteriological condition of the periapical tissues. The operation can be performed with local anesthesia in a few minutes, but the utmost aseptic precaution is necessary to make the result of value.

921 N. 15TH ST., N. W.

(To be continued.)

* See "A Dental Trocar," by L. D. Coriell, DENTAL COSMOS for December 1918, vol. ix, p. 1154.

A New Species of Dentist: Do We Want It?

By THOMAS J. BARRETT, D.D.S., A.M., Worcester, Mass.

(Read before the Pennsylvania State Dental Society, at its annual meeting, held in Pittsburgh, April 29 to May 1, 1919.)

WHEN I received your kind invitation to come here and speak upon a subject which I considered of great importance to us, I was somewhat in doubt whether my enthusiasm for professional ideals did not outrun my ability to present to you in the manner which I view it the evil consequences that lie in the wake of any attempt to commercialize professional ideals. I feel, however, that I am no stranger to Pennsylvania, because it was within the confines of your state that I was taught enough dental lore to enable me to pass the examinations that entitled me to my degree. Nor can I efface from my memory the high ideals and standards that the learned professors of that day sought to impress indelibly upon our young and untrained minds. I shall, however, attempt in my humble way to present to you some of the reasons why I am opposed to legislation which, as I view it, will tend to lower the high standard which we have attained, and which I hope will not only be maintained but raised to a higher grade.

The original characterization of this new species was Dental Nurse; latterly it is Dental Hygienist. Under either designation her advent is one of false pretense. The various statutes that I am at all familiar with outline her legal existence as one authorized to clean the exposed surfaces of the teeth. Anyone at all familiar with the definition of the words nurse, or nursing, would not apply either to that work; nor would one familiar with the word hygiene coin the word hygienist, and thus apply it.

Under her present designation, Hy-

gienist, one not fully informed as to her legal status and educational limitations would likely assume that this titled person was a highly trained specialist in dental and oral hygiene, an assumption that is far from the facts and truth, as I have observed them, and as I have examined her work.

Permit me at the outset to give you a brief history of the development and evolution of this new species. The State of Connecticut, I believe, has the honor (?) of being the first to recognize and legalize this new creation in dentistry. Until within recent years a registered dentist in that state was permitted under the law to employ non-registered assistants under his supervision or direction. That allowed dentists employing secretaries, typewriters, stenographers, or plain office girls to spend their leisure time, profitably to the office, in cleaning teeth, and many of them did so spend their time. The most ardent supporter of the so-called dental nurse in that state, openly and with much outward show of sincerity and truth, declared at public hearings in Massachusetts that these women, thus trained on the typewriter or office index and a course in observation at his chair and clinic, could and did clean teeth better than any dental college graduate he ever knew.

The first of this new species I ever met came from the state of the historic wooden nutmeg. The germ spread quickly, however, even to the "wealthy, cultured, and refined" section of my own state, known as the Back Bay in Boston. Several of the leading men of that location saw at once the possibilities of profit,

with or without charity, in this new idea, and decided it was worth developing. They invited me to a conference on a proposed bill containing the new idea that was to be presented to the legislature for enactment, away back in 1906. This was the first attempt to legalize a dental nurse in Massachusetts.

The bill presented for consideration provided that any girl, eighteen years of age or over, of good moral character, on payment of a fee of \$5, could take an examination before the state board of dental examiners, and if found qualified should be licensed to clean teeth, change dressings in teeth, and otherwise assist in the office of her employer. The changing of dressings in diseased teeth by a person trained as I have stated above was too much for me to indorse, so without waiting to consider the less harmful proposal of cleaning teeth, I opposed it, and had no further discussion with them on that bill. Such credentials of fitness to permit persons to operate in the mouth I did not think met the professional requirements we as a profession should exact, even though as a member of the board I would have opportunity to examine the candidates.

The requirements for the examination, as I have stated above, consisted of the \$5 fee, a good moral character and the candidate must be eighteen years of age. And yet the advocates of this original bill in Massachusetts to legalize the dental nurse organized committees, employed attorneys and legislative agents, and went about the work of securing legislation favorable to their desires in the most systematic manner that their ingenuity could suggest, and observing lobbyists and politicians could advise and direct. But they did not succeed in passing the bill.

All this committee work, this legislative activity, circular letters by the score, personal appeals, and I do not know what else, were employed, save that every known method to secure legislation was used to aid and promote this "nurse" bill. The same methods were employed and vigorously used, year after year, by this band of "charity workers."

Their strongest argument was that it was all for and in behalf of the poor people and preventive dentistry. It was pointed out by them that the future welfare and health of the people of the great State of Massachusetts, yes, I might add the health and stability of generations yet unborn, depended on legalizing the dental nurse for charity work; but mark you, she must also be permitted in private practice under the direct supervision and direction of the registered dentist. That clause, the joker in the bill, was to work as an even offset to the charity clause in the bill, so that the charity would also come home in a substantial way to the workers for the bill.

During the seven or eight years of active legislative work I did against this measure it is safe to say that twenty-five, yes thirty-five, different bills were presented, and of every one presented not one appeared without the private practice privilege. I challenge this sort of charity and this sort of interest in public health. I repudiate it. It is rank hypocrisy. I did openly challenge it, to test its sincerity, by saying, "I will withdraw every word of opposition to the dental nurse I have ever uttered, if you people favoring this bill will withdraw from your bill all that relates to the nurse in private practice. I will accept all that relates to the nurse in charitable institutions, public schools, dispensaries, clinics, etc." The answer came back from the active leader, "My patients are as much entitled to the benefits of this work as are the poor." I submitted my case on that answer as to motive. The nurse in private practice is and was the one thing sought, as you men of Pennsylvania may soon find out, and I urge you to stand guard.

In Massachusetts practically every active supporter of the legislation for the dental hygienist subscribed liberally to the expense incurred in promoting the drive for the bill and fighting the opposition to this so-called public health and charity measure. Today they are nearly all receiving in return full payment, plus liberal interest on these contributions

through the earning power of their associated dental nurse.

Does anyone believe that you could train and equip at the present-day low standard of educational requirements a sufficient number of dental hygienists to give personal care to the teeth of all children of this great state, to say nothing of national needs, and all of this to be at public expense? That is a thought "made in Germany," and much resembles paternalism and German "kultur" and not at all likely in this or any other state.

Every hygienist graduated from the Forsyth Infirmary and ninety-eight per cent. of all from Eastman, if I am correctly informed, have found their way into private practice, not one to the field of charity. It is time to push gently aside this cloak of charity that has been the foundation stone of all the legislation thus far granted to this new species of half-trained oral operators, and to tell the facts just as they are. It is much easier and the prospects much brighter for success to approach law-making bodies with a proposition that has charity as its object and foreword than to seek the same ends through frank admission of private gain.

The most prominent propagandist in New England for the dental hygienist, being cross-examined by a member of the Committee on Public Health of the Massachusetts Legislature, stated that he employed two nurses in his office. One he paid twenty-five dollars per week, and charged three dollars per hour for her services. She worked seven hours a day five days of the week, and four hours one day; he also stated that her time was fully occupied.

Thirty-nine hours at three dollars per hour gives you one hundred and seventeen dollars, and from that subtract twenty-five dollars and you have the income from one nurse, with the returns from the other not yet reported, as well as a good idea of the charity that guides the movement. It always begins at home, even though you dearly love the common people, and charity is your public word.

The world at the present time is seething with false propaganda, and I am opposed to this particular propaganda, either under the subterfuge of deep interest in public health or charity, and wish any one of the active advocates of the nurse to point out any place where it is in operation. If the poor are to have free dental services of any description, they should have the very best or none at all. They will be far better off with none than with that rendered by the inferior and unskilled.

In communities that can in any way, by public or private funds, afford it, dental clinics should be opened, equipped with the best and most modern appliances for their safety and well-being, and the services of the best trained men obtained by paying such of them for their skill and time as will be found necessary.

PREVENTIVE DENTISTRY.

Much has been said of late on this subject, and many arguments favoring the dental nurse or hygienist contain this phrase—it is catchy and sounds good—as "the foundation stone of their support of the nurse propaganda." The propagandist is forceful in outlining the advantages that oral hygiene has in relation to tooth decay, and he goes so far along this line that he takes away from the skilled, educated, and experienced dentist everything but the mechanical tools, and turns all else over to the hygienist. She is the one to teach the people preventive dentistry, and according to some eminent writers is the only one who "understands and has the patience to practice it." The real busy dentist has not time to devote to it; he frankly tells you so, in the words of the nurse advocates. The dentist is the mechanic, the tradesman; he builds bridges and repairs teeth.

If the diseases of the teeth and mouth are preventable, the profession should put forth its best efforts to educate and enlighten the people on the simplest and best methods to employ to retain and obtain healthy mouths and teeth. Not tell them that their only salvation de-

pend on patronizing the nurse in private practice or in public institutions.

Ridiculous arguments, and yet used by writers and oral advocates of the nurse! The research department of the National Dental Association, busily and studiously engaged day after day in an endeavor to develop information for guidance and enlightenment of the profession and for the better health of our people, can abandon its efforts. Preventive dentistry in its entirety lies only in the direction of the hygienist, if the nurse advocates are to be believed.

Many of these propagandists openly and loudly assert that the dental nurse is far superior as a technician in prophylaxis to the college-trained dentist. Such a statement is not only absurd, but is insulting to the members of the profession. I have examined both, and I resent with all possible force such a statement.

I am told that a recent ordinance passed in New York provides for a dental clinic. Appropriations for its maintenance include salaries for a registered dentist in charge at the rate of \$1020 per year, and a hygienist at \$960 per year. The educated dentist, with three years of college work, is rated \$5 per month higher in the wage scale than the hygienist after eight months of training. Such is professional ethics when the active leaders get a fad and a desire for a profitable hobby.

We as a profession are fully agreed that preventive dentistry and improved public health lie in the direction of oral cleanliness. Then let us as dentists assume the responsibility for the proper enlightenment and thorough presentation to the public of the best methods for them to use. This is our work, and its development our duty. Let us not turn it over to the hygienist, and say we are too busy to give this great work that will promote and maintain health the attention it deserves. Let us not say by word or by attitude, dentists only repair teeth and supply substitutes and that the science of saving teeth and improving health is in the hands of the dental nurse. Heaven forbid!

I am opposed to anyone being allowed to operate in the mouth under a lower standard of educational requirements than is at present demanded of the dental student. The three years' course for dental students proved insufficient to meet the requirements. The public and the profession demanded a better product; we now require a minimum of four years. Are we going to open wide the doors of opportunity to a species of dental adventurers to operate in the mouth after seven or eight months' training? I hope the answer from the great State of Pennsylvania will be a vigorous "No." Do not let down the bars for such camouflage.

I have been a state examiner for twenty-five years and have examined and re-examined fourteen thousand dentists, and feel that I ought to be well acquainted with and possessed of as much knowledge of the average dentist's ability, his ethics and character, as any man in the profession, and know how this new species with from seven to eight months' training will fill a long-felt want in some offices.

I believe I know some, and think you may know many offices where she will always be permitted to earn her salary, and as much of the office expense as the dentist under whose direction she may be operating at the time will consider prudent and profitable. It is not at all likely that in such places the legal limitations restricting her work under all conditions will prevail. It is contrary to all known examples of human frailty.

In the most offhand manner, you are told by editorial writers in some of our dental literature that the police powers of the state will take care of all violators of the law. Anyone with any experience in attempting to protect the public from the ignorant and incompetent practitioner knows that the laws we now have to safeguard them are unable to reach them except in the most flagrant cases.

How would it be possible to reach the registered hygienist licensed to operate in the mouth; licensed to have at her command and ready for use every instrument and appliance known to dentistry?

Who could discover violations under such conditions? No one save the patient in the chair could convict a licensed hygienist disposed to go beyond her legal limitations. I feel sure you cannot hold her under the direction of the dentist for any length of time, any more than I believe you can restrict her to cleaning teeth for a life's work. She will overcome the first barrier through legislation, and the second through a desire to aid the office in her leisure or some other equally strong motive.

COMPARISON OF THE DENTAL NURSE TO THE MEDICAL NURSE.

Many comparisons are made by the propagandists with the medical nurse; there is nothing in common between them. That is so evident to the medical nurse that their organization was represented at the hearings on the bills in Massachusetts, and filed strong protest before the Committee on Public Health in Massachusetts against the use of the word nurse as applied to this new species. That protest forced a change of name, and the word hygienist was coined to fit.

It has been urged in argument, and may be again, that the precedent established by the medical profession might with success be followed by us. But the cases are not analogous. The medical nurse generally performs most of her services in the home and in the absence of the physician, or at the hospital in the temporary presence of the physician. The surgical nurse assists the surgeon, but never attempts to perform even the most trivial operation. And, furthermore, medical nurses are equipped with a three years' training course. The hygienist, on the other hand, is at most a one-year product, and unlike the medical or surgical nurse does her own operating, provided she is in the constructive presence of her employer. The reasons for her existence are not founded in theory or practice upon the same grounds as the nurses who assist the medical profession. Even the medical nurses protest against the use of the word nurse in con-

nection with this species in dentistry, because they are proud of their work and resent the importation of an inferior article.

The medical nurse is the finished product of a thorough educational system, with three years of hard and thorough training divided between theory and practice, day and night. She is not any short-cut, suddenly developed specialist.

We have laws legalizing dental nurses in from four to six states at the present time, and in every one of the laws enacted there is a binding provision to the effect that this nurse or hygienist shall work under the direction and supervision of a registered dentist, absolutely. In other words, those who framed and caused to be enacted these various laws saw to it that the hygienist or nurse would be tied by law to them, and could operate or practice only under their direction and in their office.

Now, I submit to you that this shows one of two things, either her incompetence is acknowledged or a revenue from her earnings is desired. When this nurse or hygienist is legislated into being and is examined by the state board—under the law creating her or him—and meets the requirements of the law and is duly registered, she then should be entitled to practice her calling as a nurse or hygienist without further restrictions or restraint. She is either fit to practice or she is unfit. If she is fit, why does she need direction? If she is unfit, why should she be registered, or allowed to practice at all? If that is not good logic, I do not know what is. She either meets the requirements of the state law as to her fitness or she fails. If she meets them, she does not need your guidance, and she should be allowed to go forth under her own direction. New York is the only state where the law says "her." It says "him" in Massachusetts, and I can see within a short time, she or he will not ask for your approval nor submit to your direction or supervision, but will gain liberty by changing and amending the laws that bind, and go it alone as specialists in dental hygiene.

To those who object to her being

granted liberty and freedom in the pursuit of a living, unhampered and uncontrolled, and fortified under a license granted by the state, the pertinent question may properly be asked, Is your objection to her freedom in the interest of the dentist who profits by her legal custody, or in the interest of the public, whom you say she is competent to serve? Which, may I ask? When this day of liberty and freedom comes to the hygienist—and it is not far distant in some states, if I am correctly informed—then we shall have the tooth-cleaning department added to the manicuring, hair-dressing, and chiropody facilities of the up-to-date department stores and hotel barber shops.

The dental nurse was originally intended for the busy practitioner with a practice among those who would appreciate the benefits of polished teeth and a gum massage. I have had the pleasure of inspecting the mouths of many of these patients who have had the price, and paid it for the benefits of this exclusive treatment. I have lived long enough to know that there is not and never can be a sufficiency of the good things of this life to go around on a basis of equality, and consequently the full enjoyment of this exclusive treatment will always be limited to a small minority.

If you will turn your direct gaze and attention on the advocates of the nurse in private practice, instead of on the theories they profess and ignore; if you will ask to have pointed out what charity and public interest they have ever shown and directed in this great cause, you will find that their interest in preventive dentistry does not extend much beyond their own office. It is on account of this interest that they attack those who oppose them, and start a network of useless controversy about theories and results here and there, which even if they could not be conclusively proved to be impracticable, would still not justify the nurse in private practice. It is quite natural that poor suffering humanity struggling for dental relief and improvement should be blinded by this

false light and hope. Let the profession speak out, and through its societies, state and national, put an end to this false propaganda.

There are some well-intentioned persons attracted by theories being spread abroad, who without realizing that they are intended to keep the minds of men from consideration of the real issue, see only that there is a possible means of benefiting the general health of the children, and that it might do good. Such people only add the weight of their influence to the self-seeker.

THE PROPER MEANS OF MEETING THE NEED FOR ORAL HYGIENE.

What is our duty, then, as a great profession? Is it to indorse this movement for the nurse in private practice, or to devise ways and means to meet the national needs in an effort to overcome diseases of the mouth in the millions of our people? The vital importance of this condition concerns the whole dental and medical professions, and the departments of health, hygiene, and education in every state, city, and hamlet in this country. To meet this situation with any hope of improving it, we must do it by liberal and democratic education, open to all.

There is no question about the cleverness of the nurse propaganda, in that it has set the dentists and some civic workers to talking about something that has no direct bearing on the situation that confronts the dentists of this country. It throws dust in the eyes under cover of so-called theories that could never be worked out, and hides the real issue.

Twenty-five million school children alone in this country. Are we going to provide dental nurses for all of them, and on an eight months' basis of education, and then operate the clinics at public expense? Well, we shall have quite an imposing array of nurses on the payroll doing preventive dentistry, and with woman suffrage, we can see the present type of dentist looking for a safe place to sit down.

The New York authorities in their recent ordinance rated the registered dentist only \$5 per month higher than the hygienist, and no doubt they will have many applicants for the place. Why not take the young dentists, at this cut rate in professional service, the recent graduates, train them further if found necessary to meet the exacting requirements of the nurse advocates, so that they may specialize in oral hygiene. Let them do this work in the offices of the busy dentists, the dentist who must have the hygienist to keep apace with his practice, the demands of his patients, and the desire of his pocket.

If the dentist pleads that he is unable to devote his time to such important work as preventive dentistry, then the profession will be forced to do as tradesmen, who under the pressure of competition and in order to maintain their necessary income, cheapen their products and increase their marketable output.

Here you have men who after this year must give four long years to acquiring sufficient knowledge to be deemed safe to operate in the mouth. Will you create a new species, with an eight months' course in training, and allow them the use of every instrument from the scaler and the scalpel to the electric engine and the X-ray? Will you allow them to operate in the mouth on a few months' training with the entire dental outfit at hand, and expect that conscience alone will keep them scrubbing teeth and doing nothing else?

I believe there is a place for a properly trained, educated hygienist or dental nurse. There is a field for this work in the public schools, in charitable institutions, in hospitals, dispensaries, out-clinics and the like, but, gentlemen, there is no place for her in private or public practice on a lowered educational standard, absolutely none.

The great accomplishments of American womanhood during the war have added to their creditable record, and woman has made her place on a parity with man. It is not necessary to curtail her limitations nor to abridge her rights. Woman did not set the standard for the

education and training of the hygienists; as such she did not exist. She has been created, called into legal existence in some states by some of the men of the dental profession, and they set the standard, and set it so low that it discredits her. I know of no one who objects to her coming if she attain the standard of education and training that the environment she is called on to enter requires and demands.

We have eminent medical authority warning their patients and the public as well against the methods we now use in root-canal fillings, and against all crown work on devitalized teeth; against all bridge work where abutments are devitalized teeth; against all fillings in devitalized teeth.

On the one side, we have medical men openly advising the public against our methods of practice as injurious to health, and the revelations of the X-ray justify to an extent this advice. On the other hand, you have certain men who openly acknowledge their time too valuable to practice the best methods known at the present time of preventing decay and oral diseases, yet are unable to meet the demands of their patients or the public, either in the treatment of decay and its attendant results or pyorrhea and its systemic effects. And these same men offer as a solution of this grave situation the dental hygienist, with from four months to a one-year course of training and education.

Whither are we drifting as a great profession? We are raising educational requirements to four years at one entrance to the profession, and establishing another entrance where one year or less will suffice, and permit the legal use of every instrument and appliance that the four-year product can use. Their only restrictions against doing every operation and every treatment of the four-year product are the honesty of their employer and their own conscience.

Now, then, I believe we are going too fast and that but a small per cent. of the profession favor the hygienist in private practice, and that much harm will follow in her trail. I believe the profession in

general and this organization in particular should go on record along conservative and sane lines that have been advocated in years past.

Oral hygiene as well as general hygiene of the body should originate at home; should be practiced there. Here is the field for dental education along the lines of oral cleanliness. It is the solemn duty of the dental profession to arouse the public to the importance of clean mouths. It should be made a part of the curriculum of every school in this country; children will then receive both home and school instruction and reminders, rather than an occasional scrub up at some public tooth-cleaning station in charge of the nurse.

I believe the responsibility for enlightening the public is squarely upon the dentist and the dental organizations of this country, not upon the so-called nurse.

I further believe:

(1) That the first duty of the dental profession is to secure the active co-operation of the medical profession in the crusade for clean mouths as an absolute necessity for health.

(2) That the dentists should unite, and conduct an active campaign of education of the public in matters affecting the health of the mouth.

(3) That in order to accomplish great and lasting results, we must have the aid of the state and local boards of health and education.

I believe that the investigation by these four agencies should include the advisability of providing for proper and efficient methods of teaching the children of the schools the care and treatment of the mouth with frequent and persistent school inspection and toothbrush drills; that this will do more to insure oral cleanliness, prevent decay, and act as a safeguard against the spreading of infection than any other method that has

ever been proposed. It will help to establish in our schools the principles of personal hygiene.

There is certainly great need for a large amount of direct hygiene teaching in our schools, and it should include not only the teeth, but the body, eyes, skin, and the digestion. All should be taught so carefully that every child will give answer in his habits and appearance.

I believe when the people, and especially the children, fully understand that tooth decay with its terrible consequences and excruciating pains is to a great extent preventable with clean mouths, that rapid progress with lasting and beneficial results will be attained.

The real issue of the question under consideration is whether mercenary profits received from the services of the hygienist will be commensurate with the loss to the profession for commercializing its aims and ideals. The merchant and the workman are primarily in business for the gains and profits they may receive. My ideal of the professional man would be shattered if I believed that his entrance into the professional field and the practice thereafter of his profession were guided and controlled by the desire to make money, and like a wolf in lamb's clothing use the cloak of a dignified profession to shield his actual practice as a mechanic and tradesman.

The true professional instinct is found in the man who places his calling on the high plane of devoting his education, his talents, his experience, his all, that humanity may be relieved of its sufferings, and that posterity may bless him for the legacy of good he has left them. To my way of thinking, it should be the desire of the dentist to make himself proficient even at a sacrifice of income.

518 MAIN ST.

[See also *Discussion*, as reported under "Proceedings of Societies," this issue.]

Histo-pathology of the Jaws and Apical Dental Tissues.

No. V:

Development of the Peridental Membrane.

By EUGENE S. TALBOT, M.D., D.D.S., Chicago, Ill.

SOME of the early authors claim that the membrane which invests the root and also lines the sockets is one and the same, while others claim that there are two distinct membranes. The theory that there are two membranes results from the fact that the tissues upon either side of the membrane are entirely distinct, and are different in structure, the alveolar process of bone being located on one side, and that of cement of the tooth root upon the other. In this connection Tomes says:* "A mere inspection of the connective tissue bundles, as seen in a transverse section of a decalcified tooth in its socket, will suffice to demonstrate that there is but a single membrane, and that no such thing as a membrane proper to the root and another proper to the alveolus can be distinguished; and the study of its development alike proves that the soft tissue investing the root and that lining the socket are one and the same thing; that there is but one membrane, namely, the alveolo-dental periosteum."

Other authors state that the membrane is situated between the roots of the teeth, investing the roots and covering the walls of the alveoli; that it is reflected from the periosteum covering the outer alveolar wall, and enters the alveolar socket as a single membrane, giving nourishment to the bone on the one hand and to the cementum on the other; that the fibers on one side of the membrane enter the bone, and on the other side the ce-

mentum. Another author says, "It is intimately connected with the submucous layer of the gum and with the periosteum of the alveolar process." These theories are supposed to have been worked out from a microscopic standpoint.

Others reason that cementum is the only structure connected with the teeth which resembles bone. They go so far as to state that there are Haversian canals in the cementum and dentin. They reason, therefore, that because the cementum does in a measure resemble bone, and because it is derived from the peridental membrane, a single membrane can produce true bone on one side and cementum on the other, and that the peridental membrane nourishes both. All admit that the structures of the membrane differ on either side. The part nearest the alveolar process, the fibers, are grouped together in conspicuous bundles, not unlike any ordinary fibrous membrane, while on the other side, where it comes in contact with the cementum, it consists of a fine network of interlacing bands, many of which lose themselves in the surface of the cementum.

The alveolar process being entirely different in structure from the cementum and the fibers on either side of the peridental membrane also differing in appearance, how is it possible for this thin membrane to carry on two distinct processes at the same time? It seems to me that it would be just as impossible for one membrane to manufacture and nourish bone on one side and cement on the

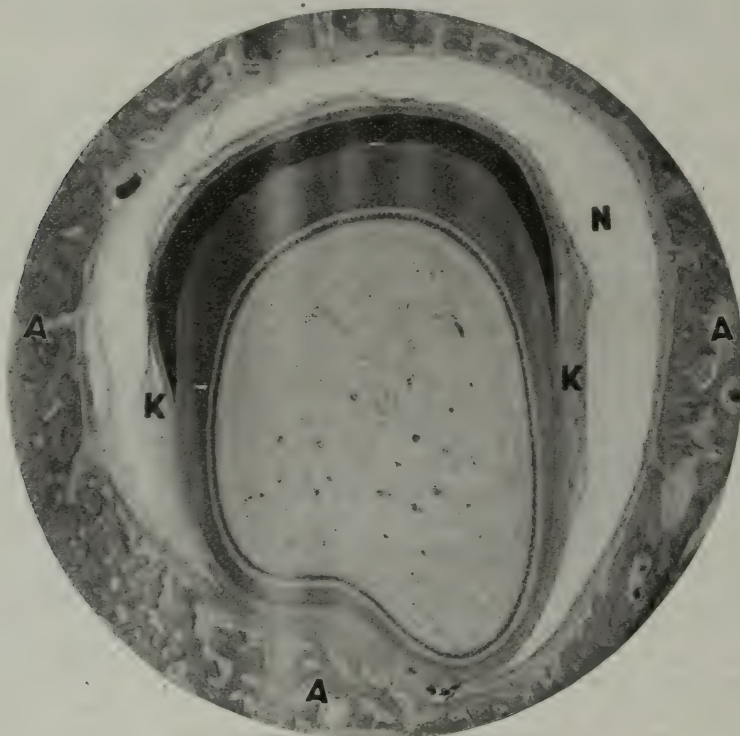
* Dental Anatomy," p. 93.

other, as it would be to manufacture shoes in an automobile factory or automobiles in a shoe factory.

We all know that the peridental membrane through its cementoblasts does form the cementum, but who has ever shown that the peridental membrane produces, nourishes, or repairs the alveolar process? How, then, are we to account

tion in order to show the bone around it: A is the alveolar process, κ the fibrous sac inclosing the dental tissue. The external epithelial layer is seen between the sac and the fully developed enamel. There is seen at N a wide space between the fibrous sac and the fibrous tissue at the edge of the bone. At a certain period in the development of all

FIG. 1.



(Magn. 24.)

for the development and behavior of these structures?

If we are fortunate enough to secure tissues of jaws and teeth just at the right moment, when the enamel is completed and the dentin formed upon the periphery of the dental papilla, including the root, we shall find that the fibrous sac which incloses the dental structures has, in most cases, contracted closely against the enamel and dentin. Such a condition is seen in Fig. 1. This picture was taken at a very low magnifica-

tion in order to show the bone around it: A is the alveolar process, κ the fibrous sac inclosing the dental tissue. The external epithelial layer is seen between the sac and the fully developed enamel. There is seen at N a wide space between the fibrous sac and the fibrous tissue at the edge of the bone. At a certain period in the development of all

Broomell* has shown dissections where

* "Anatomy and Histology of the Mouth and Teeth," second edition, p. 319.

he has exposed to view the tooth follicle by removing the structure above, and has also removed the tooth sacs and their contents from the bony sockets without injury. This work must have been accomplished at about the period of development as shown in the picture. They resemble balloons anchored to the ground.

A little later fibers begin to develop at the edge of the bone and extend across the moat, uniting with the fibers of the sac wall as observed at the left of κ . These fibers are not unlike pontoon bridges stretched across the moat to gain access to the citadel other than by the drawbridge. Later the fibers fill the entire space and the bone fills in the trabecula, extending to and encroaching upon the fibrous sac, which becomes the peridental membrane. The fibers of the sac wall, which become the peridental membrane, are much finer than the fibers on the outer surface, which form the matrix for the deposit of the lime salts and eventually become the alveolar process. Coming in contact and mingling as they do, it is easy to explain why the inner fibers are called principal fibers of the peridental membrane, and the larger coarser bundles of fibers which form a distinct layer are called the dental ligament, and which bind and hold the teeth in their socket. The development of the fibrous tissue and bone may be seen at the base. Three small arteries (part of the nidus) are seen just outside the fibrous sac at the base, in what will later become the inter-dentino-cemental space. Up to this period, there being no connection between the tissues, the only nourishment received by the sac has been furnished by the nest of arteries at the base. While the bone is developing, arteries, veins, and nerves also develop and extend throughout the bone, cross the moat in the fibrous tissue, and enter the sac wall as far as the dental structure. Here they loop and anastomose with arteries extending from those at the base of the root and end of the tooth. This makes the alveolar process an end-organ.

It is at this period that the structure

becomes specialized, and the cementoblasts begin to develop from the inner surface of the sac wall—which now becomes the peridental membrane—and form cement upon the outer surface of the dentin. The nourishment for this purpose is supplied by the arteries passing through the alveolar process. The specialized membrane extends around the crown. The fibrous sac is attached to the root, sometimes just beyond the edge of the enamel, sometimes to the edge of the enamel, and sometimes quite a distance short of the enamel, depending upon the location of the outer layer of the epithelium. When the tooth erupts and the crown passes through the alveolar process and gum tissue, the remainder of the fibrous sac and sometimes the external epithelial layer are deflected from the root at the neck of the tooth to the side of the gum tissue opposite the gingival space.

The alveolar process develops, nourishes, and repairs itself through its own bloodvessels. The peridental membrane obtains its blood supply through the alveolar process, the nidus of arteries in the peridental membrane and the main arteries entering the dental foramina, which are given off before they enter the tooth root.

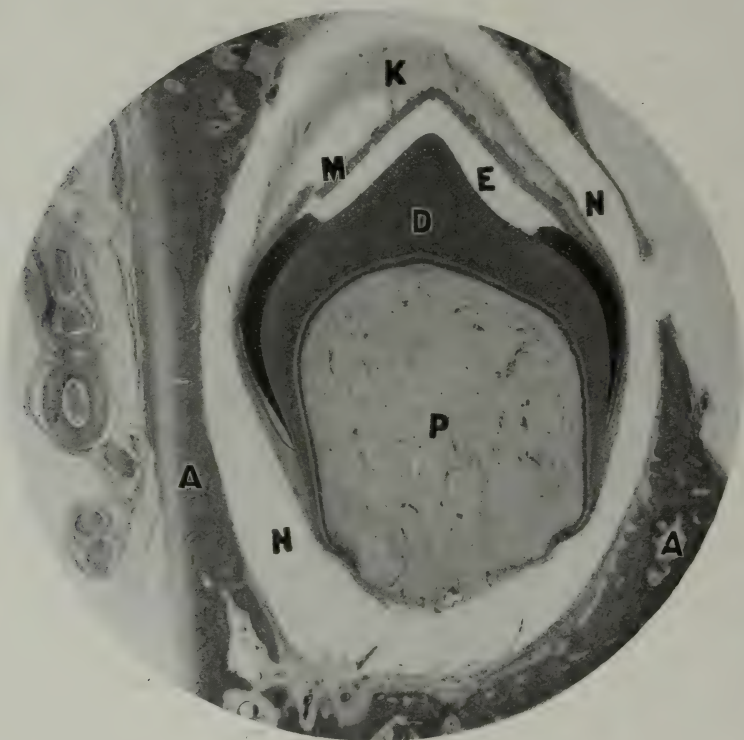
The peridental membrane, therefore, seems to have nothing to do with the alveolar process except to hold the fibrous tissue in connection with it. It will be seen that the peridental membrane does not see the light of day, "the submucous layer of the gum or the periosteum covering the outer wall," until the tooth erupts and takes its position in the mouth.

Fig. 2 is a low magnification of the dental follicle showing all the tissues in their normal position, except for the loss of enamel at the top, and the separation of the follicle from its base at the bottom of the picture: A is the alveolar process just beginning to form, D the dentin forming, E the enamel completely formed, κ the fibrous sac which has thinned out and contracted upon all of the tissues, including the outer epithelial layer M , P the pulp, and N the moat. The den-

tal papilla is forming the dentin through the row of odontoblasts on its periphery. The odontoblasts are developing along the base, as observed by the dark line. Some of the base arteries are seen in the papilla and others are seen in the fibers at the base and near the bone. The enamel is completed. The outer epithelial layer *M* is in direct contact with

opment: *A* is the alveolar process, *D* the dentin, *E* the enamel completely formed, *K* the fibrous sac, *M* the external epithelial layer, and *N* the filled-in moat. Fibrous tissue from the bony structure has extended across the moat entirely around the follicle, and has filled the gap, except for a short distance at the base, which is rapidly filling in. New

FIG. 2.



(Magn. 13.)

the inner layer of the sac and the outer layer of the enamel. The fibrous sac holds the ends of the outer layer of the epithelium at the enamel margin, and of course cannot extend down the root of the tooth. This, then, is a picture of perfectly formed tissue before the bone has developed about the follicle and the follicular wall has become specialized.

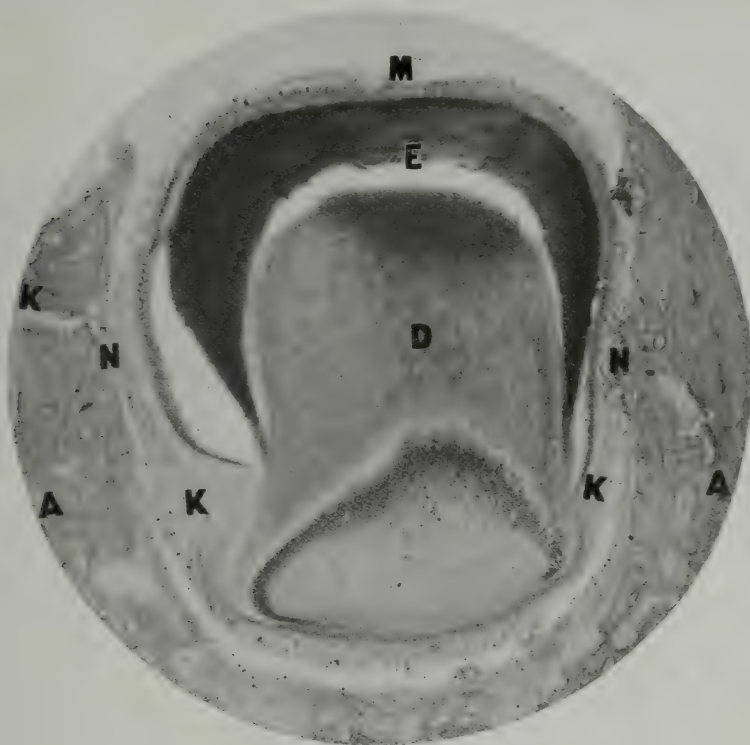
Fig. 3 shows a similar condition of the dental follicle; the tissues as a whole, however, are further advanced in devel-

bone tissue is gradually working its way across the moat toward the fibrous sac, which is now fast specializing to the peridental membrane. Arteries for the nourishment of the tissue within the follicle walls are seen in the papilla and in the peridental membrane at the base. Note the distance between the end of the enamel and the external epithelial layer on the right side, and their close proximity upon the left side. Cement can only be deposited below the epithelial

layer, hence the difference in length between the cementum and the enamel at the neck of the tooth. The bone has completely formed, and the peridental membrane is in its normal condition, so

come completely specialized, and with this demonstration and explanation any student can readily understand why the fibers nearest the cementum would be much finer than those in connection with

FIG. 3.



(Magn. 16.)

that the blood supply is thoroughly established throughout the alveolar process, the dentin has outlined the root of the tooth and the cementoblasts have begun to form for the purpose of forming the cementum. The sac wall has now be-

come completely specialized, and with this demonstration and explanation any student can readily understand why the fibers nearest the cementum would be much finer than those in connection with

31 N. STATE ST.

(To be continued.)

The Chloramins in the Treatment of Pyorrhea.

By DAVID S. STERN, D.D.S., Philadelphia, Pa.

FROM clinical observations it can be safely stated that pyorrhea, generally speaking, must be divided into two great classes. First, that class embracing those cases caused by systemic disturbances and waste products floating in the blood stream; secondly, those cases arising from purely local irritations. Therefore the question of whether or not pyorrhea can be permanently cured must naturally rest upon its relationship to these two great etiological classes. If we determine that our case in question belongs to the first class, then we must eliminate the constitutional disorder simultaneously with our local treatment, otherwise we must obviously fail. If, on the other hand, our case belongs in the second class, then it is always possible, with careful treatment, to effect a cure, and sometimes in but a single course of treatments—this of course presupposing that the patient subsequently observes the classical rules of oral prophylaxis.

In that class of stubborn constitutional cases where co-operation with the patient's physician has failed to bring about the desired result, we must strive to eradicate, by careful treatment, those local manifestations which are giving the patient so much discomfort, impairing his digestive functions, inviting infection at distant points, poisoning his food, and threatening eventually to deprive him of the masticatory mechanism. At least this much can be accomplished with surprising effectiveness, in the shortest time and in the simplest manner, by the methods described farther on in this article. In fact, the results obtained have been so gratifying that one is tempted to state impulsively that all cases are absolutely curable. But we

must bear in mind that those persistent constitutional cases present frequently recurring deposits of subgingival and serumal calculus which must be removed whenever it appears, in order to maintain the tonicity of the local tissue and thereby preserve its natural resistance against invasion by destructive micro-organisms.

THE CHLORAMINS.

After thorough and careful mechanical treatment and the surgical removal of irritating foreign bodies, we naturally turn our attention to the therapeutic measures necessary to assist nature in her eliminative and reconstructive activities. The ideal therapeutic agent would be one which would destroy all existing pyogenic and parasitic organisms, converting their poisonous toxins and by-products into inert substances, remove necrotic tissue, and at the same time exert a non-irritating, healing, and tonic effect upon the adjacent delicate structures. The drugs in general use approach in some measure this ideal, but all of them have a more or less irritating, caustic, or destructive action, increasing instead of ameliorating the havoc already inflicted by mechanical trauma. And especially is this action contra-indicated in view of the reaction of the sensitive, delicate peridental membrane, which must be at all times carefully protected.

The above-mentioned ideal therapeutic agent is most nearly approached, in the author's opinion, by that group of antiseptics known as the chloramins, but most particularly in regard to pyorrhea, one member of this group, which will be discussed a little farther on.

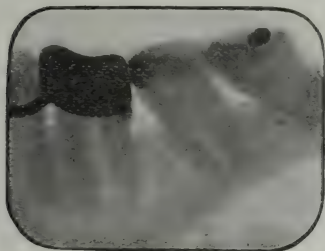
The chlorin antiseptics include sub-

stances such as chlorin itself, hypochlorous acid and its sodium and calcium salts, and the chloramins. The chloramins are substances containing active chlorin linked to nitrogen in the form of NCl groups. They are all unstable compounds, and react in contact with micro-organisms and surrounding substances usually present with bacteria.

It has been said that no class of antiseptics received such wide employment during the recent war as those of this group. In their application to the many cases of virulent wound infections no others proved so efficient and satisfactory, and of as great value to the surgeon. It behooves us, then, as pyorrhea requires both surgical and antiseptic

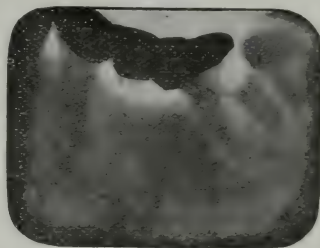
THREE TYPICAL CONDITIONS GIVING RISE TO PYORRHEA OF LOCAL ORIGIN.

FIG. 1.



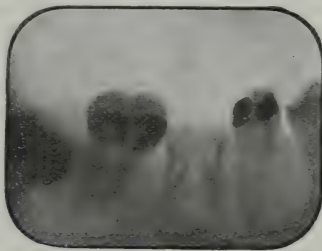
Piece of excess cement protruding from gingival margin of badly fitting gold crown. Also small calcareous deposits at gingival margins of second and third molars.

FIG. 2.



Large cavity in body of crown underneath molar abutment. This was a constant source of infection from decaying food particles.

FIG. 3.



Broken-down crown and putrescent root-canals permitted to remain without treatment.

The antiseptic action is brought about by the chloramin being brought in contact with bacterial and other proteins, at which time the active chlorin is converted into inert chlorids or inert organic substances in which the chlorin has become united with carbon. Therefore, in using this agent, its action will continue only as long as there is active chlorin remaining undecomposed. This means that in most of the chloramins the best results are obtained through frequent renewed application.

treatment, to consider their use seriously as a rational therapeutic procedure.

The antiseptics of the chlorin group most commonly employed in the treatment of infected wounds are—(1) Hypochlorous acid and its sodium and calcium salts, such as the so-called Dakin's solution. (2) Dichloramin-T, the abbreviated name for toluene sulfondichloramin. (3) Chloramin-T, the abbreviated name for sodium toluene sulfonchloramid.

The action of these compounds is

practically similar, but it will be interesting to note their difference in certain properties, and thereby to recognize the last mentioned—chloramin-T—as most worthy of our consideration in the treatment of pyorrhea.

(1) Hypochlorous acid and the hypochlorites (Dakin's) are best suited for cleansing septic wounds by continuous irrigation. They decompose and dissolve necrosed tissue, are very unstable, and must frequently be renewed and introduced into all parts of the wound.

(2) Dichloramin-T is dissolved in an oily medium, is sprayed on surfaces and carried to accessible parts of wounds. It is not so unstable as those substances in group 1, its action being of much longer duration, but it does not respond so well in contact with watery secretions. It is valuable for dressing recent wounds not requiring irrigation.

(3) Chloramin-T can be used in stronger solution, is quite stable, and exerts a more prolonged antiseptic action and is more effective when acting in much blood or watery secretion. It is non-toxic, less irritating, and has a mild solvent action on necrosed tissue. A 2 per cent. solution has a coefficient of two hundred times that of phenol, and is more powerful than a 1:1000 solution of bichlorid of mercury. It is a deodorant, produces healthy granulation, and is indeed an almost ideal agent for our therapeutic treatment of pyorrhea. It has been conveniently put up in highly compressed tablet form under the trade name of Nuklorene, and when properly used is effective even in quite advanced stages of the disease.

TREATMENT.

In the surgical and mechanical treatment of pyorrhea cases, the author has found that one of the most important adjuncts to the necessary armamentarium is the compressed-air unit. Its usefulness consists of its ability to wash away food debris and other soft deposits, and for drying purposes. It is important, in working so close to delicate structures, like the peridental membrane,

that no unnecessary impediment be permitted to interfere with the direct vision of the operator. In all cases there are many retreats, such as the pyorrhea pocket *per se*, the loose gum margin the exaggerated interproximal triangular space due to the shrinkage or destruction of the interdental papillæ, and the ledges formed by the edges of accumulated calcareous deposits, from which it is extremely difficult to dislodge soft debris by ordinary methods. Hand syringes of every description, both for air and liquids have been tried, and we have found it impossible to remove all traces of these accumulations from even shallow crevices, whereas a strong compressed-air spray will leave the field of operation free from extraneous matter. This is therefore our first prophylactic step, using the official alkaline antiseptic solution as our medium. We are then ready for scaling.

It matters little what scalers are used so long as the ultimate result is obtained, *i.e.*, the thorough scraping of crowns and roots charged with calcareous deposits with as little injury as possible to surrounding soft tissues. In addition to the regulation set of scalers the author has found that three curved chisels of graduated sizes have proved invaluable for the removal of heavy deposits, especially from lingual surfaces and buccal aspects of upper and lower molars. They are used as hoes and their broad convex surfaces can be pressed back upon the gum tissue without laceration, at the same time imparting a massage-like stimulation to the tissues. They also facilitate speed in scaling by removing large quantities of calculus at each stroke.

The bulky and most accessible deposits are removed at the first sitting. It is during this operation that most of the bleeding from engorged vessels and profuse serous exudations occurs, obscuring the operator's vision. Therefore the more delicate and thorough scalings and polishings are completed at subsequent visits. At this stage, that is, at the conclusion of our first scaling operation, we are ready for our first irrigation with

the chlorin solution, and an irrigation is made at the end of each scaling operation thereafter.

TECHNIQUE OF APPLYING CHLORAMIN-T.

We have been using in our cases the tablets previously referred to. They are remarkably stable and with a little care will keep indefinitely. One of these tablets dissolved in 1 oz. of water makes a 1 per cent. solution, which is sufficiently powerful for ordinary purposes. In particularly virulent cases a stronger solution can be made.

An irrigator with non-corrosive metallic parts must be used. We have tried many different instruments of this character, and have found that the best one for our purpose is the irrigator designed by Dr. Emerson R. Sausser of Philadelphia. It is a glass piston design with a very fine gage platinum cannula fused into the end of the glass barrel. In addition to the fineness of its gage the cannula is flattened slightly at the end, facilitating its introduction into the smallest pocket or space.

Before irrigating, one point which from clinical experience we have found worthy of emphasis is that of establishing dryness of the area of irrigation. This is done for the purpose of excluding, so far as possible, any unnecessary moisture in the form of saliva or other secretions containing protein substances which would, in contact with our solution, tend to liberate the free chlorin before it had reached its goal, thereby diminishing its potency and also unnecessarily diluting the solution.

We have found that the most satisfactory method of drying is by a process of isolation of the parts by means of cotton rolls. The lower teeth being treated first, medium large $1\frac{1}{2}$ -inch cotton rolls are placed all along the buccal, labial, and lingual surfaces, the patient being instructed to relax the muscles as much as possible with the mouth open, at the same time keeping the tongue in such a position as to hold the lingual rolls in place. In cases of heavy salivary flow the saliva ejector is also used. A

generous wad of absorbent cotton is then employed to sponge off most of the moisture, and ready-made cotton pellets are introduced into the interproximal spaces and other small reservoirs. These pellets are removed in a few seconds, after which a warm-air blast of about 10 lb. pressure is applied. We are now ready for irrigating.

The cannula of the Sausser irrigator is introduced successively into all pockets, care being taken to reach the extreme bottoms. The piston is slowly depressed, projecting only enough solution to fill the pockets to overflowing and bathe the adjacent tissue. The cotton rolls will effectually absorb all excess solution. The assistant must be constantly on the alert to renew the rolls as they become saturated, either with saliva or the solution. The solution is allowed to remain in the pockets for two or three minutes, when it is absorbed and a fresh application made. This is repeated three or four times, after which the rolls are removed, and the patient is permitted to rinse the mouth and rest. The upper teeth are, of course, much simpler to dry, it being necessary to place the rolls only buccally and labially. Irrigation is again performed at a subsequent sitting and repeated until the gums regain a normal, healthy appearance. We have found that in the most severe cases not more than three applications are necessary for a very satisfactory result, and the average case requires only two. An almost miraculous improvement will be noticed even after the first application. Between visits the patient is instructed to rinse the mouth frequently, using a $\frac{1}{4}$ of 1 per cent. solution.

REPORT OF A TYPICAL CASE.

Mr. S., age thirty-four years, presented with a typical case of pyorrhea of the local type. Had not visited a dentist in four years. Complained of every tooth in mouth aching. Profuse bleeding of gums upon brushing of teeth and masticating. Examination disclosed heavy calcareous deposits on crowns and sub-gingivally. Teeth stained and covered with film. Slight exudation of pus at two points upon pressure with finger. Gums

swollen and considerable capillary engorgement.

At first sitting gross deposits removed, teeth brushed and gums massaged in order to encourage bleeding and relieve engorgement. Then irrigated with chlorin solution.

Two days later, gums considerably shrunken, very little bleeding while scaling, and paler in color. Again irrigated at conclusion of careful scaling.

At third sitting thorough polishing and again irrigated.

At fourth sitting—end of eighth day—tissues practically normal. No pus. Gums hard and pink. Irrigation. Patient discharged.

Bibliography: "Handbook of Antiseptics." Dakin and Dunham.

MEDICAL ARTS BUILDING.

Davis Crown Technique.

By HAROLD L. STAPLES, D.D.S., New Haven, Conn.

THE object of this article is to present a technique of fitting the Davis porcelain crown accurately to the gingival margin of roots so that there will be no overhanging margins to irritate the gingivæ, which all know leads to a predisposing cause of pyorrhea.

After having filled the root-canals, keeping asepsis ever in mind, because the life of the crown depends upon the perfect root-canal filling which will prevent the formation of an apical abscess, the root is ground down flat even with the gum tissue in the interproximal space, and beveled off on the labial side until the surface is below the margin of the gum. This can all be done with a single flat stone $\frac{1}{8}$ of an inch wide and $\frac{3}{4}$ of an inch in diameter, revolving away from the root-canal, which will prevent it from injuring the gum margin.

The next step is to use a seamless copper matrix band a little larger than the root as a retainer for a modeling-compound impression of the top of the prepared root. This impression is best obtained by using a small cone of modeling compound, which is made very soft, and then, while the band is held in place around the root, the compound is forced into the band and against the root. After the compound has hardened take a bite with wax of the region with which the

Davis crown will articulate, and also the matrix band, which should be removed with the bite.

These operations can be performed in a few minutes and the patient can then be dismissed until the next day.

In the laboratory the impression of the root is packed with amalgam, and a small pin, such as a Victrola needle or bit of wire, is placed in this amalgam, and made firm with more amalgam about it. The post, as we shall now call it, is then coated thinly with wax, and small grooves made in the amalgam to insure accuracy in replacing the amalgam post in the model.

The amalgam is allowed to set for a few minutes, while a model is being poured in plaster and mounted on a bridge articulator or a backward extension.

After the plaster has set, separate the compound from the models and you will have a reproduction of the root in amalgam which can be removed at will, and easily used for grinding the base of the Davis crown accurately without the necessity of using carbon paper and guesswork to fit it to the root.

This technique will eliminate those blue gum margins one so frequently sees around the necks of Davis crowns.

1138 CHAPEL ST.

Report of a Case of Impacted Third Molar Extracted Under Infiltration Anesthesia.

By R. L. CHASE, D.D.S., St. Louis, Mo.

THE patient, a young lady, presented herself with a fistula opening externally opposite the apex of the upper canine on the right side. After having called on her physician to have her "boil" treated, she was referred to me for a dental examination.

The teeth on the right side, both upper and lower, were gone over thoroughly in a vain endeavor to locate an infected area. Even the teeth on the left side were included in this digital examination, but also failed to reveal anything which might be causing the trouble. The antrum of Highmore was examined, but no pus could be expelled from there.

Radiographs were then taken, and an impacted upper third molar was revealed. Everything else was normal. This tooth lay well under the surface, inclined buccally and slightly forward, with the mesio-lingual cusp resting against the root of the second molar.

It was decided to remove the tooth at once under infiltration anesthesia.

The syringe used was the ordinary metal hypodermic, fitted with the flat, oval-shaped hand rest on the plunger instead of the long, narrow hand rest, which is made to fit the shape of the hand. With this larger hand rest a firmer grip of the instrument is possible, and a steady even flow of the liquid from the needle is assured. This is an important point, and is necessary in all cases where any kind of local anesthetic is given.

The needle used was the well-known hexagon hub with the straight point, the point being 27 gage and one-quarter inch in length. The fine gage is necessary in

starting the anesthetic, for if a large gage is used the initial puncture will cause unnecessary pain, and startle the patient. The writer prefers the straight needle to the curved in all cases, and believes that if this is used at all times, the operator, by becoming more familiar with its use in different cases, will be able to handle the instrument better at all times. The anesthetic used was a 2 per cent. solution of "McMillin's novocain" tablets, made purposely for this method of anesthesia. Any novocain tablet of a reputable make will be found suited to this work.

The method of injection was as follows: The gum and surrounding tissue were bathed with an antiseptic solution, and the point of the needle inserted just under the surface. (The finger may be pressed firmly on the gum close to the point of injection, thereby avoiding all pain.) A slow pressure was then started, and several drops of the liquid forced into the part. This quickly spread, and a slow steady pressure was maintained while the needle was inserted deeper, being careful to keep within the desensitized area. When the entire outer area was anesthetized (this was easily seen, due to the suprarenin in the solution), the needle was inserted at a point from which the periodontal membrane could be reached. The injection into this area was made slowly and steadily for about one minute, twenty minims of novocain being injected. It is necessary to force the liquid into this part at such an angle as to force it to follow the membrane to the apical region of the tooth. From there it will spread to all tissue sur-

rounding the tooth, and entirely block it from the nerve centers.

It must be remembered that the injection was not made into any nervous tissue, and that only one tooth is blocked off.

The overlying gum tissue was then incised in two directions, and the flaps laid back and held while a small amount of process was excised. The tooth was loosened and tipped to a convenient position with an elevator. The bayonet-shaped forceps were then employed, and the tooth removed. The operative area was then aseptized, and the wound closed with two catgut sutures. The patient did not experience the slightest pain during the operation, and left the office feeling fine.

An examination of the tooth showed it to be rudimentary, the roots being imperfectly developed with the developmental sac in place. During the three succeeding sittings the socket was irrigated with an efficient antiseptic, and a

counter-irritant applied. The fistulous tract was taken care of by the physician. The case healed beautifully and quickly due to the small amount of trauma produced.

The advantages of infiltration anesthesia in cases of this character can be readily appreciated. The patient is entirely under control at all times and is able to assist by expectorating and holding the head and mouth as directed. The field of operation is practically bloodless. Thus the operator may proceed with his thoughts entirely on his operation, and is enabled to obtain the very best results in all cases.

A very pleasant feature of this method is the fact that the patient is able to leave the office immediately after completion of the operation feeling no sickness or stupor, with practically no bleeding, and entirely in a pleasant frame of mind.

METROPOLITAN BLDG.

CORRESPONDENCE

"Benzoic Acid a Valuable Antiseptic and Devitalizer of Bacteria."

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—In the September issue of the DENTAL COSMOS, there appeared an article on Benzoic Acid, p. 898.

I want to modify the formula given under "Modified Benzoic Acid Solution." I find that a clearer solution is obtained by the revised formula given herewith.

Saccharin may be added sufficiently to sweeten, and Tr. Cudbear Comp. may be added to secure a golden color, then filter through talc.

R—Acidi Benzoici,	gr. lxxx
Thymolis, }	āā gr. x
Mentholis, }	
Ol. Cassiæ,	} āā ℥v
Ol. Gaultheriæ,	
Ol. Menth. Pip.,	
Acidi Borici,	ʒiv
Alcoholis,	ʒiv
Glycerini,	ʒij
Aquæ Dest.,	q.s. oj

Very truly yours,

GEORGE J. BLEECHER, D.D.S.

PHILADELPHIA, PA.

PROCEEDINGS OF SOCIETIES

Pennsylvania State Dental Society.

Fifty-first Annual Meeting, held at Pittsburgh, Pa., April 29 to May 1, 1919.

(Continued from page 1115.)

WEDNESDAY—*Evening Session.*

The Wednesday evening session was devoted to an illustrated lecture by Dr. J. M. PRIME, Omaha, Nebr., on the subject of "Nature's Scheme in the Forms of Human Teeth."

THOMAS J. BARRETT, of Worcester, Mass., who read a paper entitled "A New Species of Dentist: Do We Want It?"

[This paper is printed in full at page 1205 of the present issue of the DENTAL COSMOS.]

DISCUSSION.*

THURSDAY—*Morning Session.*

The meeting was called to order by the president, Dr. Spencer, at 9 o'clock.

The first item of business was the report of the Registration Committee, read by Dr. A. C. BARCLAY, Pittsburgh, as follows:

Number of members registered.....	518
Guests, including students and applications as new members	224
Total	742

Dr. BARCLAY. I would like to suggest for the consideration of the Council and members, the necessity for having a secretary for registration, a man who would attend all the meetings, keep in touch with all the component societies, keep a black list, keep a list of all who apply for membership at each meeting and are turned down so their names could not come up again.

On motion, duly seconded, the report of the Registration Committee was referred to the Council.

President Spencer introduced as the essayist for the morning session Dr.

Dr. J. D. Whiteman, Mercer. It is particularly gratifying to me to hear this problem, upon which I have so long had most positive convictions, so ably presented. Dr. Barrett has so thoroughly and convincingly covered the ground from its several angles that I can really see no need for any attempt on my part to add to it.

I am particularly gratified that the essayist has not attacked the proposed solution of the problem, by the creation of the dental nurse, without offering another and I think far more practical solution. It has long been my belief that it is the legitimate function of each individual to keep himself clean, and I believe the teeth offer no exception to this rule. Also very early in my practice I recognized the large measure of truth in the statement that a dentist does not really save teeth; he merely puts them in such

* [We regret that we are unable to present the discussion of this paper by Dr. Geo. S. Schlegel, Reading, who read his discussion, the manuscript of which failed to reach the reporter.—Ed.]

condition that his patients may save them. Now in establishing a department in our offices for the purpose of attempting to keep our patients' teeth clean, we assume a responsibility that by all the considerations of decency and self-respect is theirs; but just as surely as we volunteer to assume even a small part of that responsibility, will they depend upon us for a very large part of that disgusting, even revolting and undignified service. I believe, then, as suggested by Dr. Barrett, that a persistent, energetic campaign of education in personal oral hygiene will so reduce the requirements for this character of service that the demand for such service can be and will be better met by the qualified registered dentist than it could possibly be by the partially trained dental hygienist, for, after all, the most effective service that we may render to the public in this direction is helping our patients and the coming generation to save their teeth, and to teach them to help themselves.

I would not be understood as being in any way antagonistic to the legitimate practice of oral prophylaxis or the surgical or therapeutic treatment of pyorrhea or other pathological conditions of the oral cavity; but I have no patience with the idea of turning the treatment of pyorrhea, the dental problem farthest from solution, over to a class of partially trained assistants in no single respect qualified for the work. I would only urge that we recognize the fact that in addition to the education of the public in the fundamental principles of oral hygiene, our responsibilities begin where the responsibility of the public ends.

I deplore the too prevalent tendency of the dental profession of falling into the error of assuming that teeth are to be saved by an occasional scrubbing, and of encouraging the public in the belief that a clean and healthy mouth is not possible through their own efforts. I contend that it is. We dentists are doing it for ourselves and are requiring the members of our own families to do it for themselves. And what we and the members of our own families can do and are doing by the intelligent use of the tooth-

brush, our patients can do equally well.

Dr. Barrett has pointed out that the task suggested for the "new species of dentist" would require an army of tremendous proportions; and it most surely would; yet the output of our educational institutions, our only source of supply, would be necessarily limited. While the fact of their services having received the indorsement of the dental profession, and the public being taught that the services of the dental hygienist are necessary to the saving of their teeth, the dentist not fortunate enough to secure one of these hygienists would have to meet the demand for this menial and degrading service, until this "new species of dentist," has increased to such numbers as to enable him to secure one or more and annex a tooth-scrubbing, mouth-renovating, or, if you please, a dental toilet department. Surely this proposition offers a far from inviting prospect for a dignified and scientific profession. The rational solution of the problem, it seems to me, as has been suggested by Dr. Barrett, is along educational lines. Our duty is plain to preach the doctrine of personal oral hygiene persistently with all the force that is in us, that "they who have ears to hear, let them hear," and "he that is filthy, let him be filthy still."

Dr. P. V. McParland, Pittsburgh. The Program Committee should not only be commended for their selection of a subject so timely as the title of this paper we have just heard, but they should be particularly congratulated upon the selection of a man of the character and experience of Dr. Barrett to be the essayist upon the subject.

It has not only been a pleasure, but it has been profitable to me, as I am sure it has been to everyone present, to have heard this most excellent paper. Clear, concise, forceful, fearless, Dr. Barrett has not only handled his subject in a masterful manner, but in a way that puts a new construction upon a subject that has agitated our society for some time.

Frankly, I for one had not thought of the dental nurse other than as a wonderful panacea for all the ills that befall

the busy dentist. I have threshed this matter out pro and con with a great many of my friends in the profession until I have come to think with the essayist that instead of being a thing of wonderful promise to the profession, it is in reality a menace.

Mr. Chairman, I do not propose to go into detail in the discussion of Dr. Barrett's paper because to anyone feeling as I do upon this question, this paper permits of no discussion; but I have a few thoughts that may merely serve to emphasize some of the things that Dr. Barrett has told us.

Let us first consider the rapid strides dentistry has made in the development of one phase of its character, that is the study of the diseases beginning at the gum margin. Has it not been a wonderful help to us in mastering some of the phases of dentistry? Is not a thorough understanding of these diseases necessary in the proper construction of a crown, or of a bridge; in the proper preparation of a cavity, in the proper construction of a filling, or the tying of a simple ligature, if you please? Has the study of these diseases not been made at an enormous sacrifice by men of the type of Black, Noyes, Miller, and others? Have we ourselves not made sacrifices that we might be able to better practice our profession by devoting a large part of our time to the study of these diseases? Is it not a fact that these studies have been an incentive to us to do better and more scientific work? Is it not also true that a thorough study of the pathological tendencies peculiar to the gingival tissues has played no small part in the making of our profession a really scientific body? If these questions can be answered affirmatively, and I challenge anyone to answer them otherwise, would it not be the sheerest folly for us to turn over the treatment of these important structures to a girl, who shall have devoted one school year to acquiring all of the knowledge that we ourselves have not been able to acquire in years of study and practice?

Does the physician permit the medical

nurse to treat in any way, manner or form a patient suffering from even the mildest pathological condition? Does the surgeon permit the surgical nurse to do other than perform merely the simplest duties during an operation? Would it be considered proper for him to delegate to the nurse even the simplest part of an operation, the suturing of an incision, for instance? Since the answer is obviously in the negative, why should we as dentists, delegate to the prospective dental nurse, whose training would be infinitely less than that of the medical or surgical nurse, the treatment of tissues so important as the investing tissues of the teeth?

Dr. J. M. Prime, Omaha, Nebr. *Mr. Chairman, ladies, and gentlemen,*—I hesitate to take the floor again. I feel that you have heard enough from me; but I cannot resist the opportunity to speak a word on this vital subject. Very complimentary things have been said and I am glad I could be here to hear them. I want to compliment you again on having the opportunity of listening to this wonderfully masterful presentation of this side of the subject. I studied Dr. Barrett from the beginning of his discussion until the close, and it certainly was a masterful essay. How fortunate we are in having in our ranks a man of the caliber and power of Dr. Barrett. How many of us thought what a wonderful lawyer he would have made. Would not you like to have Dr. Barrett defend you in a case at law, where your life and liberty were at stake, were he a lawyer? You ought to feel equally honored, and more too, for Dr. Barrett came here in defense of your professional rights and dignity and liberty. A man's motive for doing things is always considered in law. What was Dr. Barrett's motive in coming here in defense of our rights? Are they selfish? What is he going to get out of it? A man who has devoted his life to the upbuilding of the standards of dentistry, unselfishly giving of his time and money, months and years of labor, examining thousands and thousands of dentists to ascertain their com-

petence to prosecute the dignified profession of dentistry!

I almost refrain from reviewing any of the arguments or any I might think of in defense of his side or the other side of this question. I would, however, suggest with regard to the speaker who said in defense of this new species of dentist that in his observation women did better prophylactic work than men, that I am sorry to hear such a confession, even though it may be true, and I shall not dispute it; but if they can do better prophylactic work than we can, they can do better work of any other kind than we can. How many of us have had people come to our office suffering from ulcerative gingivitis and tell us, on good authority, that they got it at some dentist's office? If we cannot control these men who are licensed and authorized to practice our profession, and teach them to be aseptic and clean and prevent them from spreading disease broadcast through the country, how are we going to do it with the irresponsible girl, one having only eight months' training? Would you like to have this incompetent person treat a case of ulcerative gingivitis or any other mouth condition where streptococci and other deadly germs are present? Would you like to take her chair and trust to her methods of sterilization, and have her treat diseases of your gingivæ? It has been discovered in treating the periodontal diseases and scaling, scraping, and cleaning the roots of teeth that we have been doing a great injury to the roots of teeth in over-polishing them and scaling them, opening up the ends of the tubuli wherein thousands of organisms may find a lodging-place, and consequently making an uncleanly surface that otherwise might be fairly clean and aseptic and prophylactic, and rendering it susceptible to the invasion of bacteria. Remember the cementum and its relation to the investing tissues; how are we to know that the dental hygienist can remove calcareous deposits from the roots of teeth without injury to those tissues? They are a constant open receptacle for infection, and I will admit that they do need a whole lot

of attention they are not getting; but I certainly agree with Dr. Barrett that that attention must be given to them most intelligently and skilfully.

Dr. F. D. Miller, Altoona. In the first place I want to say as Dr. Hertig said yesterday, it takes an awful lot of nerve to get up and say the things you believe. I want every friend I have in Pittsburgh to know that what I say on this subject, I say from the bottom of my heart. Dr. Barrett's paper reminded me of a saloon keeper whose name was August, and who put up a sign in his saloon that said, "After the first of July, it will be the last of August." If we all thought as Dr. Barrett does, it would be the last of the dental hygienist; but very fortunately for the dental profession and the future generations, this is not the case. I believe the great majority of the conscientious, thinking, dental practitioners of this great state are in favor of licensing and regulating the dental hygienist, and that those dentists who favor such action are those who have at heart the best interests of the dental profession, their patients, and the future generations; and their motives are not, as Dr. Barrett has claimed, for financial reward. I take most emphatic exception to Dr. Barrett's statements that our interests are not for the common good and that we are practicing "rank hypocrisy." I am very pleased that Dr. Barrett has admitted that the dental hygienist would be *worthy of consideration* for exactly the same work in charitable institutions, public schools, dispensaries, clinics, etc. By his own words he admits the need of the dental hygienist; and I am thoroughly in accord with the answer he received that "our patients are as much entitled to the benefits of this work as are the poor." Dr. Barrett does not believe it would be possible to train and equip, at the present day low standard of educational requirements a sufficient number of dental hygienists to give personal care to the teeth of all the children of the state, to say nothing of the national needs. In that statement he admits that it is impossible for the dentist to give personal care to all children;

but offers nothing better, and admits the great urgent need of the very thing we are striving for.

In reply to his request that an advocate of the dental hygienist point out a place where the dental hygienist is operating for charity, I wish to call his attention to the city of Rochester, N. Y. Dr. Burkhart tells me that last year the mouths of 75,000 children were cleaned by the dental hygienists of the Rochester Dispensary, under the supervision of licensed dentists; and I understand that there are sixteen dental hygienists working in the public schools of Bridgeport, Conn., and that the Commissioners have appropriated \$23,000 for the work, to say nothing of the work done in the Forsyth Infirmary at Boston.

Dr. Barrett is not very consistent. He first claims that it would not be possible to educate a sufficient number of dental hygienists to care for the millions of children of this country—a one-year course—and then says that we should have the best trained men, graduate dentists, and this now requires four years. It is at least a four-to-one bet in favor of the dental hygienist. All of the high ideals in this life are not held by the dental profession. I imagine it is possible for a tradesman to have just as high ideals as any profession, and in support of that I want to read to you "The Rotary Spirit."

THE ROTARY SPIRIT.

Red roses for the living, and handclasps
warm and true,

A heart that's tuned to giving, and strength
to dare and do;

The sound of honest laughter, the joy of
honest toil;

For those that follow after, to leave a finer
soil.

All this has been and ever will be the Rotary
plan,

A man's sincere endeavor to serve his fellow-
man.

A little less self-seeking, a little more for
men,

Less bitter in our speaking, more kindly
with the pen;

A little less of swerving from paths of truth
and right,

A little more of serving and less of dollar
might.

More peaceful with our neighbors, and
stauncher to our friends,

For this all Rotary labors, on this its hope
depends.

To smooth the way for others, to make of
life the most;

To make the phrase "our brothers" mean
more than idle boast;

To praise sincere endeavor, when praise will
spur it on;

Withholding kind words never until the
friend is gone;

This is the Rotary Spirit, this is the Rotary
dream,

God grant that we may near it, before we
cross the stream.

Dr. Blair. I understood from Dr. Barrett's paper that the principal objection to the dental hygienist is lack of training and education. I believe a girl can learn to fill teeth just as well and in as short a time as a man can, and it seems to me when a person has taken a thorough course and knows all the details of one operation, he or she ought to know the general effect on the whole system. I understand that a person who has specialized along one branch is more able to do that one operation, but before he begins to specialize he has to go through the whole course of medicine and dentistry, and it seems to me that prophylaxis, being as important as forming a bridge or filling teeth, should require just as much preparation as the dentist.

Dr. Fordham. I, with Dr. Prime, think the legal profession lost a mighty good man when Dr. Barrett went into dentistry. Logic is the science or art of exact reasoning; but logic started on a wrong premise carries you farther away from the truth than anything else. Loss to the dignity or loss to the finance of the profession—that should not be our point. We should consider the loss to the public. I am surprised at the quotation, "Let him who is filthy be filthy still." I would like to ask every gen-

eral practitioner who would be willing to have one hundred of his patients taken at random and have their mouths examined from a prophylactic standpoint, to rise to his feet. [Practically every person in the room arose.]

Dr. McCartney. Our essayist has touched on a vital point. You may pass all the legislation you wish, but you are losing sight of the fact that that dentist will not stand the test. When you have passed such legislation you are letting the bars down to the laboratory man in your office. You cannot pass legislation permitting girls to do a thing and say that men cannot do it. That is the most serious point, I think, brought out, and I do not think we care to have every laboratory man in the State of Pennsylvania operating in the mouths of our patients.

Dr. T. W. McFadden, Wilkinsburg. I feel something like the colored fellow who was swimming to the promised land; on the shore was a lion and in the water a shark, and he did not know whether to go ashore and let the lion eat him or stay in the water and let the shark eat him. That is about the condition we are in now. I do not know whether it is better to legalize these dental nurses and permit them to carry on their work, or to allow the people to suffer from lack of service. The main question in my mind is this: If we admit the nurse on a lower standard of education than the dentist, that nurse should, by all that is justice, be under the direct control of the dentist. If they have the same education as a dentist, they have a right to practice wherever they wish. There is no place for a dental nurse in a factory or school, or any place else, if they are not under the control of the dentist. Until they have that equality of education they have no right to the same privileges. When you put them in the factory or school the dentist has no control over them, and the public will recognize them as equal to the dentist, and there is where your trouble will begin. If you are going to put them in, put them in under the direct control of the dentist, whether it means more profit to the den-

tist or not. How much profit the dentist can make is not the question. The question is, How many more people are we going to serve? We are not serving one per cent. of the people today. The kind of prophylactic work the average person gets from the average dentist at the present time is pretty bad, as you all know. So I am in favor of the dental nurse under the control of the dentist.

Dr. T. H. Hayes, Butler. It seems to me there are a great many things to be said for and against this question, but it looks to me as though it is like a great many evils: If you can license and control them they would be all right, but most evils that are licensed cannot be controlled. One feature that has not been brought out today is this: If you pass this legislation it looks to me as though you are playing right into the hands of the advertiser. If this law goes through, every advertising man in the country will employ hygienists and make capital of it, whereas the ethical man will employ a hygienist and say nothing about it.

Dr. Alfred P. Lee, Philadelphia. There is one question I should like to ask the essayist: What organized effort was there on the part of the propagandists for the hygienists to place graduates from Forsyth or Rochester, in the proper institutions, or were these graduates entirely absorbed by private practitioners? It seems to me that is one way to answer the question as to the charitable idea of this propaganda. I believe every one of us here has been telling his patients that the scaling and cleaning of the teeth is one of the most important operations that we have to perform. No matter how rapidly the institutions prepare these dental hygienists and turn them out, they could not for a long time provide enough to give one to every ten dentists in the state. What, then, is going to be the attitude of the patients toward this operation? They will say to us: "How does it come that one man can relegate this operation to the hands of a young woman who has received but eight months' training, while you have always tried to impress upon me that it

is one of the most important operations you perform?" It seems to me you are going to belittle the work of scaling and cleaning, and to me it is one of our most important operations.

Dr. J. C. Hertz, Easton. I rise to express my gratification for the paper that Dr. Barrett has presented and the able and forceful manner in which he presented it. The legislative aspect of this question seems to be the greatest stumbling-block. There is no legislation but what some time is violated; but we have got to take care of the people's teeth. We are preaching oral hygiene and prophylaxis of the teeth, and there is nothing that has drawn the attention of the layman in the United States to this matter as has the expression that has taken form in Europe since our men entered into the war, "*that you can tell an American by his teeth.*" The reason of that was that the army made the men keep their teeth clean. I am a hearty supporter of proper legislation, surrounded, of course, by proper safeguards.

Dr. R. E. Denney, Philadelphia. There is one point that has not yet been touched upon. If I should ask this body what is the most discussed subject before the dental and perhaps the medical profession today, you would unhesitatingly answer, the danger to the general health from focal infection. What has that to do with this subject? Just this. The way to prevent focal infection about the root ends of teeth, is to prevent the death of the pulps of the teeth. And the way to prevent the death of the pulps is to see our patients at frequent intervals, so that small cavities may be discovered and filled before they endanger the life of the pulps. Well-trained patients stimulated by pride will come to us often to have their teeth cleaned and we then have our opportunity to discover any small cavities and repair the damage, thus solving the problem of focal infection about the teeth by preventing it from becoming a problem. If we delegate the cleaning of teeth to a dental nurse, particularly one outside our office, this opportunity to serve our patients is lost.

Dr. J. F. Biddle, Pittsburgh. There are two points that I hoped somebody else would mention, but so far they have not. My first query is: If one wants a dental assistant, if one wants a hygienist, why not go a little farther? Why not get a real dental assistant? I want a dental assistant and I am going to have one; therefore, I have started a girl in at the dental school to take our four years' course in dentistry. My reason is that I want an assistant of some value, one who upon the completion of her course will know something about operating in the mouth, and not like one of Henry Ford's mechanics who, when he does anything outside of turning bolts 17 or 18, is lost. How can one expect to accomplish much with the aid of an assistant who knows but one little thing, and has no comprehensive knowledge of the whole subject? Another fact I might mention, while on the subject of the dental assistant, is that this girl one year after her graduation from the dental department will also take another college degree, so that if the chief does not keep up, the assistant will know more than he does. The point I wish to make, however, is this, that this is the kind of an assistant that ought to prove of value.

The second point is that a statement was made which I hesitate to let go by unchallenged; namely, "that the majority of dentists in Pennsylvania want the dental hygienist." I have here a report made by the Oral Hygiene Committee which states that there are six societies in favor of the dental hygienist; eight societies were not sufficiently interested to make any report; two were opposed absolutely, and three considered the move questionable, and when I say that, I mean the secretary simply gave us as his opinion that these societies so considered it. Out of the six that are for the oral hygienist, the paid membership for this year is to date 199. We have a paid membership in this society, to date, of 1072. Surely these figures speak for themselves.

Dr. H. E. Friesell, Pittsburgh. One gentleman used a phrase here today that

it might seem does not have much bearing upon the essay; but it is important to remember that in dentistry as in other business we depend upon the newspapers for publicity. The business man and the newspaper man cannot understand why the professional man is opposed to "advertising." Advertising *per se* is not a crime. If I have a dog that I want to sell and I advertise it in the newspaper; that act is not unethical. Let us call these fellows what they are. *Dishonest advertising* is only one of the methods used by a group of unscrupulous men. Let us refer to this type as the charlatan, quack, fakir or unscrupulous practitioner; but do not use loosely the term "advertiser." We are misunderstood because people think we are opposing some fellow who is calling the attention of the public to the fact that he is able to do something for them. I do not think the essayist said anywhere in his paper that everyone who advocated the dental nurse was necessarily selfish or did not have the public's interests in mind. He did not say that all those who favor the dental nurse are necessarily selfish. There are those who desire to provide dentistry for people who cannot afford to pay the ordinary practitioner's prices. There is another phase of that situation; some of us advocate the licensing of the dental nurse and would like to have that dental nurse receive a regular four years' dental education. We may be perfectly sincere in our desire to license nurses with a shorter course, thinking that it will be for the benefit of the public; yet if for the temporary good of the public we are to break down the whole profession, will not the ultimate permanent loss to the public be far greater than the temporary gain? If you can license a specialist to operate in the mouth, when she crosses that dead line how are you to control her operations? The unlicensed practitioners operate in the mouth; you have great difficulty to stop them. You cannot control them when they have no authority to operate. We cannot control the unlicensed practitioner in this state; then how on earth can we control licensed

nurses? If we can license a specialist to practice prophylaxis or oral hygiene, why cannot the laboratory man take a three or four weeks' course and be licensed in prosthetics? Why cannot the gold crown and bridge man come from the manufacturing jeweler's workbench? You will have not only one new species of dentist, which is neither he nor she; but you will have a dozen species of dentists, and you will have, just as they have now in many countries in Europe, no *real dentistry*.

There are those who are perhaps not as practical-minded as some of the rest, and they have not realized the dangers from the quack dentist in making misuse of the licensed nurse. Suppose we give them a license; they can only practice under a licensed dentist. But the nurse is either fit or she is unfit. If she is unfit she has no business to practice anywhere. If she is fit to practice and if you have licensed her as fit, she has a right to practice anywhere, and in a little while these people will group together and say "We are simply wage slaves to these high-priced dentists who are living on our earnings. Why should we do this labor for them? Why can we not get into little offices of our own and practice dental manieuring?"

Gentlemen, I consider this the most dangerous thing to the profession of dentistry that we have ever considered. There is not a man in this State Society to whom I will take second place for the efforts he has made, is making or desires to make, to provide dental services to the public and especially to the poor; but I do believe that licensing the dental nurse is the very worst possible means we could select to solve the problem of helping the general public.

Dr. J. C. G. Fitchugh, McKeesport.
The greatest practitioner in all the healing art is the diagnostician. The man who sees the disease or lesion is the greatest of them all, and our chairman diagnosed the ability in our friend Dr. Barrett to do a great work for dentistry in Pennsylvania by bringing him here to discuss this matter. There is no man who has real red blood in his veins who

does not say at least that he believes in only one standard. In England the law profession is divided into two groups, the barrister, who pleads cases in court, and the solicitor, who looks after property and acts in his office only. But we as American dentists do not do this. We have many years of experience to look back to in England, and we can profit by their experience. Any man or woman doing an operation in the mouth should be first able to diagnose. Many of the cases I have seen recently, if left to the girl assistant or dental nurse, would have resulted no doubt in her infecting herself and many other patients coming in. I did nothing for these patients. I made a diagnosis, that is all. Unless they have some training and experience the dental assistant cannot do this. It is only through long practice and training that one can make a diagnosis. It takes a great deal of experience to be able to creditably do operations in the mouth. Should these things be left to an assistant who is trained in one or two minor particulars? That is not safe. If we give these people licenses they will not, in all liability, employ a diagnostician first, and therefore it is a very unsafe proceeding, I think.

Dr. B. P. Rial, Pittsburgh. I would like to call attention to one or two phases of the practical side of the question. The Pennsylvania legislature has passed laws limiting the practice of licensed practitioners in various lines, one of which is the osteopathic school. They were licensed to practice osteopathy, including minor operations. Within five years, by political chicanery they excluded the minor operations clause and they are now permitted to practice major surgery under our law. Only yesterday the proposition of administering drugs was taken up and it took all the vote of our Pennsylvania medical societies to put that down. We have got to look at the matter in a business-like way. The laws of Pennsylvania are unfortunately not controlled along ideal lines; they are purely political.

Dr. Barrett (closing the discussion). I fully realize that this subject has oc-

casioned some discussion and consumed considerable time. I will attempt to be brief in my closing remarks. The intelligent way in which this discussion has been conducted signifies deep interest, honest study, and a live comprehension of the importance of this matter to dentistry. Had I known that you had given so much thought to the dental nurse propaganda, I might have treated the subject in a somewhat different way. For the many complimentary references that have been made, I am indeed grateful; for the honest criticisms of those who differ with me, I also thank you. Some of the points raised have already been answered. The educated hygienist, I am now and have always been in favor of; never objected to her. I think I made clear my position on that. I object to anyone being permitted to operate in the mouth who does so from a lower standard of training and education than that of the dental student, and I base my objections on my experience as an examiner of the output of the dental schools of this country for more than twenty-five years.

One of the comments was to the effect that I was willing that an incompetent should operate upon the poor. On the contrary, I said the poor should have the very best dental service or none at all; that they would be better off with none than with that furnished by the incompetent.

Dr. Whitman's comments on personal hygiene must be heartily indorsed by everyone and his references to that dreaded disease, pyorrhea, are of great value and interest.

Dr. McParland's comments show his deep insight and wide knowledge of the subject as well as the danger of permitting any but those with the highest training and skill to even touch these tissues. I wish more of the profession had the importance of the field of their operations as firmly fixed in their minds as has **Dr. McParland**.

Dr. Denney's point in regard to early discovery of decay is well taken and his logic is of the very best.

Dr. Friesell has cleared up and added

so many valuable points that are entirely new that I shall not attempt to elaborate on them. He has submitted them with his usual clearness and force and has also brought out additional points of great value, important to those of us who are attempting to have both sides heard and not allow the propaganda to have full sway.

With reference to Dr. Miller's remarks, he evidently did not listen very well to what I had to say or he did not understand it. I am very sorry I did not furnish him with a copy of the paper. He charges me with saying so many things that I did not say that I shall not attempt to answer him, but leave that to the dentists hereabouts to discuss with him after I have gone.

I want to bring to your attention one point. A woman dentist met me in Boston the other day and handed me a newspaper clipping from a Washington paper. She is a graduate of an Ohio college, registered in Ohio and Rhode Island, where she practiced for four years with her husband, who was a dentist. He died some eight or ten months ago. Through force of circumstances, she was obliged to give up her practice in Rhode Island at the outbreak of the war. She went to Washington and took an examination for admission to the Bacteriological Department; passed successfully, and as she was in Class A was given a position. At the close of the war immediate changes were made and she found herself without a position in Washington. On reading the papers, she saw this notice to the effect that the schools needed four dental hygienists. The doctor, who is a very competent, capable woman, applied for the position but was told that not being a graduate of a school for dental hygienists she would not be accepted; that a dental graduate did not meet the requirements and was not capable of doing the work; that it required special training and that no dentist need apply. I submit that for your consideration without comment.

With reference to Dr. Lee's comments and the question he asked with reference

to placing dental hygienists in public and charitable institutions, I should like to say that at a discussion at the National Meeting in New York, Dr. Emerson, Health Commissioner of New York, said he had favored the bill legalizing the hygienist and did much to aid and effect its passage through the New York legislature, in the belief that the passing of such a law would prove to be a health measure and would benefit the general health of the public; but that he found, when the school at Rochester and the one at New York graduated their first classes and he went in search of a hygienist, the private practitioner had absorbed the entire output and there were none for charity. The charity in this scheme begins in the private office every time I have met it.

Dr. McPARLAND. I move it be expressed as the sense of this meeting that the licensing of the dental hygienist or dental nurse is detrimental to the interests of dentistry and dangerous to the public, and that the Pennsylvania State Dental Society once more put itself on record as being opposed to licensing the dental nurse or dental hygienist.

(Motion seconded.)

PRESIDENT SPENCER. All business transacted by the State Society must be brought before Council.

Dr. FRIESELL. The Council is the Executive Committee of the State Society. It is only a part of the whole.

Dr. McPARLAND. My motion was merely that it be expressed as the sense of this meeting. It does not bind the society to anything.

PRESIDENT SPENCER. Then this does not delegate anything to anybody. It is simply the sense of the meeting. In that sense it is hardly business of the society; it is giving an expression of the feelings of the people here, the same as an expression of thanks to any essayist, and in that light, I will be pleased to put the motion.

The motion was carried.

On motion duly seconded, a rising vote of thanks was extended to the essayist.

The report of the Committee on the President's Address was read.

[This report was printed in full at page 1101 of the November issue of the DENTAL COSMOS.]

It was moved and seconded that the report of the Committee on the President's Address be accepted, excluding all reference to the matter of the dental nurse, inasmuch as that matter has already been acted upon by the society and an opinion diametrically opposite to that of the Committee has been expressed.

Dr. SWING. I want to go on record as protesting against this action. Of course, I am only one, but I want to protest.

(Motion carried.)

Adjourned until Thursday afternoon session.

THURSDAY—*Afternoon Session.*

The meeting was called to order by the President at 1.30 P. M.

The President appointed Dr. Gardner and Dr. Hipple to escort the President-elect to the chair.

PRESIDENT SPENCER. It is with great pleasure, Dr. Schlegel, that I induct you into the office of the President of the Pennsylvania State Dental Society. From long association with you in work with this society and what I know of your ability, your fairness and your high professional standing, I congratulate the society upon having elected you as its President.

Dr. SCHLEGEL. I wish to thank Dr. Spencer for these very fine, flattering words. As I said to the members of the Council, this honor is one that was unsolicited, yet I am not unmindful of the great honor of being President of the Pennsylvania State Dental Society,—one of the greatest states of the Union, and one in which while we have not said the last word in dentistry, we are forever looking toward that end. Therefore, as I said before, while I have not sought this honor, I appreciate it from the bottom of my heart, and I pledge, even to the point of sacrifice, if necessary, to bring to a successful conclusion my term of office in 1920. I thank you again most heartily.

Dr. REYNOLDS. I would like to offer a motion that the thanks of this society be given the retiring President, for the manner in which he has conducted the meetings, and a rising vote of thanks for his services as Treasurer.

(Seconded and carried.)

Dr. REYNOLDS. May I again take the floor to make the same motion in connection with our retiring Secretary?

(Seconded and carried.)

Dr. SPENCER. I promised Dr. Swing to express his regrets that he was unable to be here this afternoon. He had to take an early train for Philadelphia, and as he expressed his desire to be here, I told him I would appear before the members at the time of the installation and express for him his thanks for having been elected First Vice-President.

There being no further business, the meeting adjourned.

Dental Society of the State of New York.

Fifty-first Annual Meeting, held at Syracuse, N. Y., June 12, 13, and 14, 1919.

(Continued from page 1131.)

FRIDAY—*Morning Session.*

The first item on the program was the reading of a paper by Dr. MARCUS L. WARD, entitled "Modern Tendencies in Bridge Work."

[This paper is printed in full at page 1169 of the present issue of the DENTAL COSMOS.]

DISCUSSION.

Dr. J. Wright Beach, Buffalo. I wish to heartily thank Dr. Ward for the splendid presentation of the subject he has given us—most scientific, and most scholarly, and most opportune. It has been a feast of its sort. The program seems to be well sprinkled with the bridge work subject, and it is one of the most pertinent topics of the day before the profession, for good and sufficient reasons. Dr. Hunter's name has been mentioned as bringing about the present situation. I believe we can date the upheaval from the time of his address at McGill University some years ago when he gave his opinion relative to American bridge work, which he had come in contact with in his work in a London hospital. That has given us a date by which we can bring everything along this line before the public—similar, perhaps, to the earthquake which happened in San Francisco, where everything dates from that occurrence; and truly Dr. Hunter's remarks resulted in an earthquake in our profession.

We have before us today the grave responsibility of choosing, as Dr. Ward has said, the right kind of bridge work for the right place. I assure you I be-

lieve it is a very responsible and grave consideration for us all. There is no universal method of bridge work today. I doubt if there will ever be a universal method developed. It must be a composite method, as it were, each case requiring special and intelligent consideration which must be founded on the experience of a stable and mature practitioner. I believe the majority of us are influenced in whatever methods we use, not only by our individual conception of the situation, but as well by the methods which our preceptor or our teacher in college presented to us. Every man in dentistry has ideas peculiar to himself, and he is influenced, as I say, by those two factors, possibly more than anything else. Therefore, the universal method of bridge work is something to look forward to, and perhaps, if developed, will signal the millennium of prosthetic dentistry.

Relative to the gold crown, I am reminded by Dr. Ward's remarks of a statement which Dr. Rudolph Hofheinz made some fifteen or more years ago, when I was attempting to present something which at that time I did not dignify as a method of removable bridge work, but today I perhaps might do so. In presenting this before the Seventh District Society, in Rochester, I made the remark that probably not more than one gold crown in ten would be considered sufficiently well adapted to be serviceable and accurate. That was in the halcyon days of the shining gold crown. Dr. Hofheinz took issue with me, and said, "I do not believe more than one gold crown in one hundred is correctly made and adjusted" and he further said, "I

know of but one perfect gold crown, and that is in my own mouth, and it is the twenty-second or twenty-third one made for that particular case." As I recall it, Dr. Benjamin Hert, who is here at this meeting, was the man who performed the operation of putting in that perfect crown for Dr. Hofheinz.

Relative to cements, we all know that copper cements are the most therapeutic in their action and most germicidal, we might say. There is no question but that the black copper cement, as outlined by Dr. Ward, is the best material with which to cement bridge work on a standard of sanitation and to avoid cervical irritation. The black or red copper cements are the most reliable.

Then we have a very great diversity of opinion relative to the great destruction of tooth structure necessary to place fixed bridge work by the inlay and partial cast crown method.

I think it is one of the subjects which we should face with fear and trembling, and really make it a most important topic to discuss and consider before we make any move in relation to the destruction of splendid tooth structure. As I have often said—to quote from the Bible, "What God has joined together, let not man put asunder" and I feel a good deal that way in relation to the perfect tooth. It was not applied to the tooth in Bible times, to be sure, but it applies at the present time.

Dr. Ward states as a general proposition that removable bridge work is unnecessary and unsanitary. Those two points depend largely on the case, the sanitary part particularly consisting of the degree of cleanliness which the patient possesses. The responsibility is upon the patient rather than upon the fixture.

Dr. Kennedy stated this morning that cast-clasp bridge work was satisfactory, if the patient removed it twice daily and removed any accretions on the clasp. That is all very well, but we know we can hardly get patients to do that. If it is removable bridge work, it must be something that the patient can remove and cleanse easily, and be as nearly hy-

gienic and sanitary as it would be possible to construct.

I would like to ask Dr. Ward if he has kept a careful record of the state of pulps under vital tooth attachment, and what percentage of deaths occur? What is the period of comfort and usefulness of such attachments, and has sufficient time elapsed to make safe the recommendation of such method of bridge work for the general practitioner? That question has been discussed time and time again, but it will again bear discussion, I believe. Large cast restorations over vital pulps are more or less hazardous to the vitality of that organ, and I believe we shall hear more, rather than less, on the influence particularly of thermal shock. You know what a really distressing condition presents when under a large, beautifully made inlay restoration we get pulpitis, and it is necessary to remove the inlay to secure devitalization, and thereby destroy that beautiful piece of work. We hedge and try to get around doing anything to it, until such time as the tooth becomes devitalized, or the tooth becomes comfortable again and the patient goes away and eventually goes to another dentist for relief. When that occurs under a beautifully made piece of bridge work, skilfully prepared, it is very distressing to the patient as well as to the dentist, and we should, therefore, have as much data and as much assurance as possible from adept operators on this particular point.

I want to say this, although it does not enter into the discussion of the paper: I feel that the field of clasp bridge work, properly constructed, is as great as fixed bridge work in its limited field, because we are not going to make fixed bridge work of a span greater than one or two dummies. At any rate, when we go beyond that, it should be a piece which can be removed and made safe for the patient.

The matter of apical being dependent upon cervical irritation is a pertinent subject today, and I firmly concur in what Dr. Ward has said relative to cervical irritation very frequently producing apical irritation and infection.

That is a subject in itself which calls for discussion and investigation.

Dr. Jas. Kendall Burgess, New York City. No sane dentist can blind himself to the tremendous strides the profession has made in recent years or fail to comprehend the fact that every advance has added a commensurate measure of responsibility. Every honest man must keep the windows of his professional soul open to the light and be guided by the revelations which that light brings.

Dr. Ward gives concrete expression to that idea and ideal when he says, "Since we have had the responsibility of lives of patients placed upon us where we formerly had merely the responsibility for the teeth of patients." How pregnant with meaning is that sentence and the comparison it offers. The keynote of it is responsibility and the enlargement of that responsibility with the growing realization of the unity and sacredness of the human organism. Not many years ago from human tooth to human life seemed a far call, but we have come to know that the relation of the one to the other is closer than we dared to dream or than we like to think, and that the man who is handling teeth may hold a human life in the hollow of his hand.

To one who has decried measures and methods, destructive and extravagantly wasteful of tooth and pulp in the effort to perfect one phase of a large undertaking, and fought in season and out of season for conservation and a high general average of excellence in his productions, Dr. Ward's paper comes as "Showers of blessing." When a man of Dr. Ward's ability and integrity and bull-dog tenacity in holding on to the things he believes in, weighs matters of such moment in the balance of research and practical experience, his choice is of vital consequence to the dental profession and to those whom we serve and far more valuable in the light it sheds than the opinion of one who has chosen one path and stuck to it. It is evidence *vs.* opinion and carries corresponding weight. Dr. Ward's espousal and de-

fense of the fixed bridge is peculiarly refreshing and gratifying to me at this time, for reasons which will appear in due season. It is interesting to note the change of base of those who malign the fixed bridge. First it was attacked on the score of being unsanitary, but with the coming of modern construction and the forcing of the point that sanitation is a personal equation and has nothing to do with fixation or removability—that some people *will* be clean anyhow and some (if you will pardon the grammar) *won't* be clean *nohow*; they have been washed loose from that insecure stake, shifted to the next sand bar and are tying themselves up to the foolish cry about the dire calamity that will befall two teeth secured in a definite relation to each other; and all because some blacksmith sinks two gold crowns into the gums and props the mouth open in traumatic occlusion with an extracting device that tears the patient's teeth out while masquerading as a bridge. And this wholesale condemnation notwithstanding the experience and the testimony of many producers of fixed bridges who personally and professionally are above reproach and the quality of whose productions no man of fair and open mind can impugn. These men say that God never ties two teeth rigidly together. They may be surprised when I tell them that He never made a gutta-percha pulp, nor cut off a tooth crown and superimposed an artificial substitute upon its foundation, nor put in an artificial denture, nor did many other things which those of us who have to deal with the various perversions of Nature's forms and functions feel called upon to do.

Then, there are those among us who have made the startling discovery, that Nature has provided a tooth with only enough resistance to withstand the stress put upon it as an individual and that to add the burden of sharing with its fellow at the other end of the space the support of an intervening substitute will be fatal. This again notwithstanding the fact that teeth properly anchored and properly cared for have performed this service more years than many of us have been

practising dentistry and are still doing it. These are all examples of single-track thinking, and if dentistry is suffering today from any one trouble more than another it is from the products of the one-way mind. Dr. Hunter discovered what he was pleased to call "septic dentistry," but probably never got hold of the basic fact that the resulting sepsis was not at all a matter of principle but of technique. He is more to be excused, however, than many in this country who have quoted and supported him to the point of condemning all bridge work and who, calling themselves dentists, should have judgment and discrimination enough to discover and correct the cause of failure instead of condemning an entire principle—proven beyond peradventure to be invaluable to the profession and its *clientèle*—for the technical shortcomings and viciousness of those who ignorantly or carelessly have failed to master principles and to build their technique upon them. This is the thought back of Dr. Ward's statement when, speaking of the so-called Richmond crown, he says, "It has, in many instances, been a ridiculous substitute for a natural tooth, but the men who construct them now rather than the crown, should receive the major part of the condemnation." There lies the crux of the whole situation. A man's productions must necessarily reflect his conceptions and his comprehension. The man who fails to grasp basic principles has no foundation for the technique through which his productions are brought into being. How can it be expected to be anything but a wild and rambling and vicious growth that encumbers the field? But the fact that one man allows weeds to overrun his garden and sap the vitality of its soil is no reason why gardening should be condemned and those who have the intelligence and the ability to cope with the situation be restrained from producing Nature's wonders in fruits and flowers. It is just as unwarranted to condemn the filling of teeth or of root-canals or the treatment of pyorrhea or the placement of full artificial dentures because there are incompetent men

attempting these things and producing failures as it is to condemn bridge work because of the failures this same incompetence produces.

All that Dr. Ward has said of the danger of systemic disturbances through apical infection and the relation that pulp destruction for purposes of removable bridge restorations bears to this vital subject has already met with a hearty response in many things it has been my privilege to write and to say heretofore, and it is gratifying to know that so acute an observer, and one in such close touch with the things that are as to be able to speak with authority, finds the modern tendency away from this sacrilege against the human organism. It is high time that these fearfully and wonderfully made bodies should cease to be thus fearlessly and ignominiously dismembered. If there were no other objection to the removable bridge, so long as it necessitates the removal of the pulp my motto shall be "Fixed pulps and fixed bridges." Where there is vitality there is function. Function is Nature in service, and service is the watchword of the universe, the golden key that unlocks the door to the very right of existence. Conversely, destruction of vitality entails loss of function, which means idleness, and "idleness is the devil's workshop." Every worker in restorations, as Dr. Ward has said, must make alterations to teeth, but he should feel himself in honor bound to leave their vitality undisturbed in every possible instance and so conserve function, maintain service, and forestall inactivity and lack of resistance to the vicious elements always present in the organism and waiting for these favoring conditions to set up their disturbances.

I was keenly interested in Dr. Ward's statement of the reasons that deter men from doing bridge work; a fear of this thing and a shrinking from that. In a paper I read two years ago before the Pennsylvania State Society I devoted two or three pages to the mental attitude that handicaps our professional growth. When Dr. Clarence Grieves read the paper afterward he said, that it was

beautiful language, but it made the paper too long, and when the Editor had it ready for publication in the DENTAL COSMOS he confided to me that he had cut out several pages of "verbiage" and so improved my paper. But it is true nevertheless and I hope when Dr. Ward's paper is published and read it will sink in. Distorted mentality and what we might characterize charitably as a careless morality are the sand foundations on which much of our incompetent and inadequate and destructive practice is builded. Men are far more fascinated with descriptions of technique, but I believe these spurs to clearer thinking and a higher regard for our moral obligations have their place in our literature.

As to the particular forms in which Dr. Ward prepares his abutments and the particular types of attachment he constructs to meet his needs in anchoring his restorations to these abutments while conserving their vitality, suffice it to say that they are successful or he would not be using them. One of the charms of the situation is that while correct principles are rockribbed and immovable, there is such a variety in the details of the superstructure that may be built upon this foundation as to give ample scope for the exercise of any man's ingenuity and his preferences. If therefore I should express my preference for a different type of preparation and an attachment to correspond with it, it is not at all by way of criticism but simply a restatement of the age-old truth that God never made two leaves alike, much less two human minds. In the case of a man who wears his principles as straight as Dr. Ward wears his, it is more than likely that the man who offers the criticism that he has his technique on crooked is looking at it through a distorted vision.

Dr. Ward has only indicated the headings under which he intends to discuss the cement problem, and I am glad to detect even here a note of optimism. I am not able to discuss the matter technically or intelligently, but voice the need that I am sure all of us feel of something more dependable than any I know

of at this time. Our inevitable mechanical imperfections would seem to me to make insolubility the great desideratum. I am not chemist enough to know whether or not it can ever be achieved, but I am glad to look to the essayist and his fellow investigators for its advancement.

One concluding comment. The essayist says, "I take this opportunity to record myself as saying that from now on, the chances for infection at either the apex or cervix of the roots of teeth shall be the first thing considered when I am consulted about bridge work. Much as I would like to place a good removable bridge in the mouths of some patients from the standpoint of mastication, and sometimes appearance, I shall have to be shown that what I am to accomplish for the patient must completely overbalance the destruction to the teeth necessary to place the bridge, which often increases the liability to both apical and cervical infection."

If Dr. Ward can drive the spirit of that statement home so that it will bear the fruit that the genuineness and sincerity of it deserve, it will be worth all the dental society meetings that will be held this year. Perhaps, after all, he is not quite as radical as I am, but, if I may be pardoned a bit of pleasantry, he is young yet.

Thanking Dr. Ward personally for his splendid paper, I make no apology for subscribing myself, "Yours for the Fixed Pulp and the Fixed Bridge."

Dr. R. Ottolengui, New York. I was very much pleased to find the extent to which Dr. Ward *condemns* fixed bridge work. Did you not all notice that? At the Beecher trial, there was a witness named Bessie Turner, and there was a celebrated lawyer, Mr. Fullerton. He wanted to obtain from Bessie Turner the date of a certain occurrence. She persistently said she could not remember. "Well, it did not happen yesterday?" "No." "Twenty years ago?" "No." "Last week?" "No." "Fifteen years ago?" "No." "Last month?" "No." Finally she had to come down to such a narrow space

that she said she could not remember, but it had been proved that it had occurred within a very limited period.

The advocates of fixed bridge work went on and on until finally one or two men had the temerity to put fourteen substitute teeth on two roots—that is, attached them to two cuspid teeth with a saddle back of each. The fixed bridge workers of today would not do that. Would you put twelve? Or ten? Or eight? Or six? Dr. Ward's limit seems to be five, but most of the pictures he showed us had only one.

Gentlemen, it is only a matter of degree. It is merely lessening the danger, to reduce the extra load you ask these teeth to endure.

As to the editorial which I wrote and published and from which he quoted, Dr. Ward intimated that I derived my ideas from my locality, and that in the West the dentists are doing better.

Dr. Ward. No. I mean to imply that you get your ideas from removable work in your own locality.

Dr. Ottolengui. I have not been discussing removable bridge work. I am discussing fixed bridge work. I am not through yet with this propaganda, and it is going on, and if printer's ink and perseverance can do it, we are either going to eradicate fixed bridge work from dentistry, or we are going to limit it to a degree that men can say it is safe.

Today, on the screen, was shown an attachment to a bicuspid root with a rest on a lateral.

Dr. Ward. No, sir. I did not show that.

Dr. Ottolengui. Did you not show a bridge where you did not want to cut into the lateral?

Dr. Ward. No, sir.

Dr. Ottolengui. Well, let us pass that. The last radiograph which I secured from Detroit shows such a bridge on a lug and it had failed though made in Detroit. It was not a question of workmanship, but of wrong principle. Dentists do not seem to comprehend that bridge work is bridge work, whether it is a dental bridge or a bridge across the

East River, and that the best bridge builders hold themselves responsible for the piers as well as the bridge. The man who does bridge work is responsible for it all, whether it is the root-canal work or the bridge structure: It is all bridge work. If he did not do that bridge work he would have left those good teeth alive, and I say again—I said 80 per cent. in the article quoted, but now I say 90 per cent. of fixed bridge work is septic and in many cities 95 per cent. It is not a question of locality or school influence. We are going to show that Dr. Burgess is mistaken, that it takes an amount of skill and ability to do fixed bridge work which the average man has not. I will say it takes an amount of skill and ability for a dentist to do anything in dentistry properly, and the time is coming when bridge work of any kind will be relegated to specially skilled men. Those that cannot do it properly must not do it at all.

Another thing, there is no man who ever made a bridge of any length over any chasm that made it solid like dentists do. We have every kind of bridge work over the East River, and every one has a break, even to the solid masonry bridge we call High Bridge. When you put little spans across the little places, they tear out, and we tax-payers must pay to have them put in again. If you have not flexibility somewhere, it will tear out your abutments, even though they be rocks in mountains.

Dr. H. E. S. Chayes, New York City. It seems to me that Dr. Ward's paper is a conscientious effort to defend an untenable position and mitigate to a certain extent or condone to some extent the practice of a system of dental restoration known as fixed bridge work, which, according to his own words in his present paper, has in a vast majority of cases been found not only wanting but decidedly destructive in its influence upon the human dental apparatus.

There was a time and that time was not so long ago when many men, who today would hesitate, were freely and frequently practicing these extensive restorations in the form of fixed bridges

and which practice undoubtedly at that time had the indorsement of the teachers of the various dental schools, one of which Dr. Ward represents.

It seems, if one may judge this paper fairly, that the school with which Dr. Ward is connected, has come to the conclusion that the practice of fixed bridge work must be limited. In other words, too many fixed bridges were heretofore placed in human mouths and they resulted in the loss of too many teeth, and he for one feels that it would be best or wiser to limit the practice of fixed bridge work to smaller spans and fewer cases. I disagree with him only in degree, and I feel that inasmuch as he has taken the first step toward limiting this practice, the time will come when he will exclude it entirely from his teaching curriculum.

Fixed bridge work is bad for the human mouth, because fixation is bad for the human being; because fixation is bad and uncalled for in any situation, position and relation with anything which lives and functions. The movements of natural teeth, situated in the natural environment of the human mouth are determined by the interrelationship of all the teeth, and the stress to which they are subjected; the orbit of their motion is predestined so that during their excursions they will be activating the tissues which surround them, enhance the blood supply of these tissues and thus keep supplying themselves with the nutrient element necessary for the maintenance of their integrity. Fixed bridge work destroys individual tooth motion in the predestined directions, and thus is a first-class fallacy in conception and in practice. It has been almost the most extensive blunder and the most woeful handicap the human dental apparatus has had to stand up under.

Dr. Ward is correct in attributing many cases of so-called focal infection to cervical irritation, rather than poor root-canal work, but more than this, it is not always cervical irritation but often, if not most frequently, the inability of the cervical tissue to perform its function of adequately protecting the deeper region, due to nothing but the mechan-

ical interference of a fixed bridge or an improperly executed restoration which may inhibit or augment the mobility in its proper direction of the particular tooth involved.

Nutrition and function are the reciprocal dynamic phenomena of all tissues of all organs and any reparative work done in and on any part of the oral cavity must be done with the maxim in view, that neither of these, that is, that neither nutrition nor function must in any way be interfered with.

It is definitely known that health *en masse* depends entirely upon a properly balanced circulation. The proper play of both the cerebro-spinal and the sympathetic nervous system depends entirely upon a properly balanced circulation and, conversely, a properly balanced circulation is greatly dependent upon a smoothly working sympathetic nervous system.

The processes of digestion, assimilation and nutrition are all under the control of the involuntary or sympathetic nervous system. The interdependence of all these phenomena is clear; it is a process of compensatory dynamics. Briefly, we must think good thoughts, we must have proper food, which converted into good blood, must be sent racing through the proper channels to feed all the tissues.

When the red blood in traversing its field of travel reaches the vessels where transudation is possible, the cells of the tissues containing these attenuated vessels assert their needs and, by a power of selective chemico-physiologic affinity, abstract the materials necessary for them from the mass of liquid traversing these vessels, and the liquid moves on to the next station as it were.

The heart, as the great central pump, charged with the task of the initial impulse to send the blood through all channels, calls upon all arteries, arterioles and veins to rhythmically assist it in this task.

Organs at rest need less food than organs at work, hence the rhythmic function of an organ induces a corresponding rhythmicity of action in the

bloodvessels and thus the additional amount of necessary nutrient elements is supplied.

You need thought to make money, you need money to buy food, you need food to make blood, you need blood to maintain function, you need function to maintain health, you need health to have thoughts.

We come down to the old mystic sentence that our blood is ourselves in solution and since Nature creates and maintains, she must as a logical corollary be able to cure, and she does this by way of the unfailing supply of a well-balanced circulation unless interfered with by outside influences.

It should be manifest to all thinking men and more so to dentists that, in the exercise of their function, different teeth move in different directions and that these movements conform in rhythmicity and degree to the demand of the vascular structures which surround them so as to activate or cause the supplying of the need of both teeth and surrounding tissues for an increase of nutrient elements.

If two or three teeth are inflexibly or too flexibly linked together by a fixed or a removable bridge, or if by means of an improperly executed inlay or other restoration the mobility of a particular tooth is inhibited or augmented, the waves of motion during function are altered in frequency, rhythm and direction. The small vessels in the tissues surrounding these teeth are there loaded with all the things which the tissues and the teeth need for sustenance; but the power of the cells in these tissues and teeth to abstract these materials is lost by desynchronization. The transuding vessels trying nevertheless to do their part leave a quantity of material there, the tissues and teeth cannot take it up and we now have a condition of stagnation or morbidity. A quantity of organic material, the component particles of which are vibrating in a rhythm foreign to the one of the tissues and teeth it was intended for, becomes a welcome pabulum or food for any so-called bacteria always present in us, with us, and around us.

The cycle of feeding, growth and multiplication of these organisms now begins and proceeds at a rapid rate, the breakdown of the gingiva, alveolus and finally the tooth-root follows; and this is the ultimate history of the inflexible or too flexible dental restoration, otherwise known as fixed bridge work.

Dr. V. H. Jackson, New York City. Speaking of cements I would like to say that dental operators who have had extensive experience in capping live tooth pulps, in trying to keep them alive, gradually become more or less wise in that treatment. One should know the principles and all the reasons for the dental pulp becoming so irritated and congested as to cause its death, which is easily understood. One special and important example is illustrated when removing cement from a gold tooth crown, which has been worn for a considerable length of time, the odor from the cement is generally so strong that when one handles the cement he needs at least three thorough washings to remove the odor from his hands. This experience alone should convince one that most cements are more or less absorptive of organic matter, which becomes foul and which will not be tolerated by nature, and, when such a cement rests near a living pulp, or decomposed dentin, or living dentin, it is a most certain means of causing serious irritation, often accompanied by soreness, neuralgia and final death of the pulp. So let us understand how one can treat cement to keep it practically non-irritating to the pulp.

Some of us, who have been capping pulps to protect them for many years, have learned to prevent the cement used from becoming foul and irritating by a method which I shall describe later and, in this connection, another condition should be referred to.

Some writers have described the recession of the gum tissue from teeth supporting gold crowns, as being caused by the collars of the crowns encroaching on the gum. From my observation, the recession of the gum from the crown in those cases is generally caused by the absorbent cement used in setting the crown,

which has become foul, and not by the gold resting near or on the gum. The general principle of the recession of the gum from irritation and loss of tissue by suppuration caused by foul cement may be considered in the same light as the suppuration from irritation of the pulp, or as suppuration caused by calcareous deposits on the teeth. When cement is used over tender dentin as for capping pulps, for cementing gold crowns with bands to the roots of teeth, in cementing jacket crowns to teeth where the enamel is removed, in cementing inlays where much of the enamel and dentin have been removed, for cementing collars, which necessarily project under the gum in orthodontic work, to partially erupted teeth, etc., for any of these purposes, the addition to the cement of a small quantity of pulverized crystals of iodoform will keep the cement pure and sweet to the end of time, and not interfere materially with the strength of the cement or prove disagreeable to the patient. In using a very small amount of iodoform with the cement, it will prevent the establishment of anything like a cesspool under the crown.

Iodoform used in the root-canal with any kind of filling material will keep it sweet and prevent decomposition. I might say, from extensive experience, it should always be included in the treatment and with any material used in filling to the apex of the root. I have recommended this many times before, but it is so important for us to understand its value that I want to reiterate and call attention to what we are neglecting to do. It is applicable with or after any general treatment of abscessed teeth. In applying iodoform we are treating in a surgical manner as we would other wounded tissues, and this medicament is so persistent that it favors the health of the parts for years to come. If it is used in advance and with any filling material, including gutta-percha, it will practically always tend to keep the tissues in a condition of health.

We have had numerous lectures on the plans of treatment and filling of the nerve canal. Never in any of these dis-

cussions have I heard anyone say that there is living cementum at the apex of the root which should be protected. When the pulp dies, the artery, vein and nerve which have been supplying life to the dentin have been destroyed. We should not only know but keep it in mind, that the apex of the root and the covering of the dentin to the gum line is a layer of living cementum nourished and supported by the peridental membrane, even after the dentin has become a dead tissue or an abscess is formed. Are we taking this into account when we are reaming out the canal in the cementum at the end of the root? Are we aware that we are boring out living tissue as we are reaming out the canal through the cementum? We know that we are injuring that structure by removing the living cortical lining of cementum by enlarging the apex, and in treating and filling the canal it should be constantly kept in mind that the cementum is still a living tissue. If an inflammation about the apex of the root becomes chronic and there is a serumal deposit on the root, it usually becomes necessary to remove the tooth, as the serumal deposit is seldom dissolved by treatment but continues to cause irritation, and the resulting inflammation often tends to encourage necrosis of the cementum.

Again, if the natural canal through the cementum is sufficiently large for necessary medication, the canal should not be enlarged thinking that we can insert a filling there which is more acceptable to nature than the cementum. I know of no medicament that would be missed so much in retaining a healthy state at the apex of the root after its general medication and helps to cover our many blunders, as readily as iodoform. We know of the advantageous treatment with iodoform by our experiences in transplanting and implanting teeth, also by experience in sponge grafting in endeavoring to prevent the extreme loss of soft tissues. In any of these cases, and where defective enamel of the tooth is cut away with some of the dentin for the purpose of covering the

remaining exposed dentin with a jacket crown, iodoform should be used on the exposed tissue or in the cement used for setting the crown to prevent irritation that would result from the cement and which is often found to cause the death of the pulp.

It is but a few years since articles appeared in our dental journals calling attention to the finding of arsenic in dental cements, and assigning that as a cause of the death of the pulps of many teeth filled with the cements. The writer is convinced that the unhealthy condition of the pulps was induced from the irritation caused by the cement becoming foul as described, and probably not from the arsenic in the cement as had been supposed.

Dr. Bertram B. Machat, Brooklyn. It was my intention to be a good listener and retire in silent assent and appreciation of all that I might learn from this paper; so much, however, have we heard here of the efficiency of fixed bridge work that I cannot refrain from saying a few words upon this all-important subject. I feel that my personal experience compels a viewpoint in bridge work, quite different from its usual conception and practice.

Dr. Ottolengui's story of the fourteen-tooth bridge that was mounted upon two abutment teeth cannot be taken too seriously. It is the one kind of fixed bridge work that is safe; for the reason that it will *not* stay in any event.

The present status of bridge work, owing to the perplexity over pulp devitalization is indeed in an acute predicament. As I understand it, Dr. Ward has taken great pains in the preparation of a paper in which he condemns the crown abutment and instead advocates a saner and safer procedure, namely, that of fixing bridges by means of extensive cast inlays. Because of the authority and importance that we attach to a scientific presentation before a State Society meeting, the logical thing for those who have come from far and wide to listen to this gospel on fixed bridge work, is to go home and continue to mutilate teeth, risk the vitality of pulps and impair the health of their

patients. For, has it not been promulgated by the teachers of men and even under the auspices and dignity of a State Society? It is argued that this method of inlay abutments would be ideal for single or small group restorations. This method is not advocated as an exceptional means of restoration for the few dentists who are possessed of long experience, keen judgment and excellent technical ability, but it is offered as sound practice for all, the undergraduate included.

On the other hand, if I am to judge from the condition of the constant stream of invalids that I regularly study, especially the case histories of the bed-ridden patients whose mouths I am called upon to examine, I cannot but sound a warning against any practice that necessitates the misguided mutilation of sound teeth. I maintain that such methods in the hands of any but the highly skilled practitioner are the stepping-stones to the tragedies which I behold daily; such as the loose abutment, the undermined tooth, the diseased and spontaneously devitalized pulp, focal infection, and the invalid patient.

How many of us present would trust their mouths in the care of Prof. Ward's students, or for that matter to any practitioner wholly unknown to us, for the purpose of inserting, let us say, a molar along the lines prescribed by the essayist? Yet these methods are taught to be practiced on an unsuspecting public.

In my borderline work, it is my privilege to treat mouths to the end that they may be rendered free from disease. Most of the patients require new restorations, for which purpose I direct them to their local dentist. The one condition that I hold out upon such recommendation is *restoration without mutilation*. The operator is free to follow whatever plan he may conceive as most suitable for the case in hand, but if he proposes carving into a sound tooth, the devitalization of a healthy pulp and the mounting of a fixed bridge in the orthodox fashion, I *decline his services*.

There are of course exceptional cases and exceptional dentists and hence, in

a few instances, some modification is permissible. I am addressing myself, however, to the rank and file of our profession in the interest of the great many patients; *I must "play safe."*

The dentist who can see no way of filling the gap other than by the mutilation of good tooth structure and yet is willing to benefit our patient as well as himself, is advised to bring the study models upon which we draw a detailed plan of construction by means of clasp dentures.

It is to be regretted that Dr. Beach has not dwelt at greater length upon the value and wisdom of properly constructed clasp dentures. I am fully in accord with him that this is a logical and safe alternative. Indeed, dentists upon whom I prevailed to discard the pernicious destructive and obstructive practices have, like myself, come to appreciate the genuinely constructive possibilities of the clasp and lug dentures and they too herald the slogan—*restoration without mutilation*. Granted that we cannot hope for 100 per cent. success,—and what method of bridge restoration dares make such claims?—I feel assured that nearly every case illustrated here by the author could have been better served in this manner.

Whatever may be said for or against methods of bridge work, one substantial claim is, that correctly constructed clasp and lug dentures *will* leave the teeth intact, regardless of the success of the piece. The patient will still have the prerogative, though not with my approval, of placing his teeth at the disposal of the corundum wheel or the bur.

It has been argued that clasps destroy enamel and create hypersensitiveness, etc. My several years of study, experiment and practice disprove that, always provided that the lug clasp is featured and intelligently executed.

Dr. Ward has pointed to our fallacious practices of the past and freely quoted our highest authorities on pulp devitalization and root therapy as advocated by these men years ago and since rescinded by them. Is this not the best argument for real conservation? How will we rec-

oncile the present-day methods of destruction of sound teeth in years hence?

If we care to avoid the regrets of tomorrow let us "play safe," especially at this time in the era of preventive dentistry.

Dr. Burgess. I would like to ask the last speaker, in the examination of these various cases from the various sections of the country where he did not find a single clean fixed bridge, if the fixed bridge was the only thing that was not clean? Were all the other teeth clean, and was the uncleanness confined to the fixed bridge?

Dr. Machat. I particularly have in mind the filthy bridge in the otherwise clean mouth. The patient, whose esthetic make-up revolts at the sight of the bridge when removed.

Dr. Ward (closing the discussion). I have recorded what I have to say in the paper and have nothing to retract, for there has been no new evidence presented today by those who have discussed the paper. Dr. Chayes says, that I got a hint for the stand which I have taken from the Mayo hospital. In reply to this, I am obliged to say that we have a good bacteriological staff and good surgical staff of our own, both of which are working toward one thing, namely, to determine what course to pursue in bridge work in the light of the evidence we have at hand regarding both cervical and apical infections.

I am not nearly as certain about what course to pursue as Dr. Chayes, Dr. Ottolengui and Dr. Machat are. These men seem certain that they have arrived at a state of perfection in the construction of bridge work. From what they have told you, you might think that they were well-nigh perfect and that there was little or no cause for the alarm signal I have sounded with respect to devitalization. You may draw your own conclusions from what they have said. I assure you, however, that their discussion will not change my course in any way and if I find that my practice today should be changed tomorrow or in the near future, I should not hesitate to do so.

I mentioned the Mayo hospital and Minnesota University not because we were attempting to follow someone else, but because the most cordial relations exist between those institutions and the one with which I am connected, and at the present time the three institutions are pursuing much the same course. I assure Dr. Chayes that it is not necessary for me to get my hints from somebody else. I devote my entire time to research and teaching and have bacteriological and surgical staffs with me that do the same. My observations are such that I am perfectly astounded to have men like Dr. Chayes and Dr. Ottolengui tell me that 90 per cent. of bridge work is filthy and unsanitary, for this implies that the bridge work alone is filthy and unsanitary. It would lead the average practitioner to believe that the bridge work was more filthy and unsanitary than the natural teeth in the mouth.

Dr. Ottolengui. I did not say that it was unsanitary.

Dr. Chayes. I did not say so either.

Dr. Ward. I understand that you did not say it in exactly those words, but you did say it in language which implied the same thing. Both of you men not only implied that, but implied that I do not know a clean bridge when I see it.

Dr. Ottolengui. I said septic. Most unclean mouths are in perfectly healthy people. The crux was in Dr. Burgess' question that he asked Dr. Machat. I dare say it was not the one thing that was unclean.

Dr. Ward. Dr. Beach made a statement in his discussion which would indicate that he misunderstood me. He stated that I was not much in favor of removable work and that it was unsanitary and many times undesirable. I am pleased to say that my experience with removable bridge work since 1906 has been very satisfactory in many cases. I have learned through years of experience, however, that it is no more generally applicable than is any other type of bridge work or kind of operation. It has its field where it is indicated, and since I have learned where it was indicated I have been very much pleased with

it. The point I wanted to make in my presentation of the subject today was that I had reduced the amount of removable work that I do as I have found places where it was not indicated, and I have recently reduced it very markedly because it required devitalization of the teeth. I am not ready to say that I have reduced it for all time, but I believe at the present time, with the evidence at our command, that no one is justified in making a wholesale devitalization for the sake of placing in the mouth some pet appliance of a removable nature.

During the year I see many cases of removable work made by some of the best men in this line of work in this country, and in about every instance the removable piece of work is as unsanitary as the remainder of the mouth, and in some cases the removable work is more unsanitary because of lack of restoration of the embrasure between the abutment tooth and the nearest substitute. From what I am able to learn, the practices of Dr. Chayes and Dr. Ottolengui are not so different from those of many other men, nor is their ability so superhuman that their judgment should be taken as final. In fact, I feel quite certain that the ability to do good bridge work is not all in New York.

Dr. Ottolengui. I do not want to prolong this question, but with your permission and Dr. Ward's, I would like to ask him a question. If you remember Dr. Broomell's position about devitalizing teeth, I was present when he read his paper, and his warning was this: that a large filling in a carious tooth was much less likely to destroy that pulp than a completely sound tooth stripped of all or a large portion of its enamel and immediately capped or crowned, because during the process of caries the pulp has opportunity to defend itself by secondary dentin deposits and contraction, but when you immediately cut close to it in the living dentin which is in its normal condition and then put a cap over it some of the pulps would die.

Dr. Ward told us one of his principal changes in technique is to keep pulps alive. He told us that in a few instances

the pulps had died, and that in one instance he had the worst abscess he had seen in many years. The question is, Did that pulp die because of the trauma of cutting it, or because of the presence of a foreign mass, or did it die from stasis on account of the fixation; and would it have died had it been used as an abutment for a removable bridge, and if it did, would it not be easier to take care of it?

Dr. Ward. The discussion that was given in the summarized form on cement will appear in this article more in detail. The paper as read would perhaps lead to this question which Dr. Ottolengui has very well asked. It occurs to me that we will have to consider the cements of today in an entirely different light than they were considered by Dr. Broomell and those who wrote at that time. We had then the slow-setting cements, which meant greater irritation from the phosphoric acid. The newer cements I regard as considerably different from the standpoint of pulp irritation. It is difficult to say with any degree of definiteness which one of the causes mentioned by Dr. Ottolengui brings about the death of the few pulps that die under live tooth attachments. One thing seems certain, however, that the cements are very much differ-

ent from what they once were. I do not regard it probable that the pulps died from stasis on account of fixation, for it is not possible, in my opinion, to prevent the movement of the teeth by the cementation of an ordinary size fixed bridge to such an extent that there will be stasis.

Dr. Ottolengui. To what do you attribute the death in those particular cases?

Dr. Ward. I may as well try to explain why you can literally feed arsenic to some pulps with little or no effect and why some pulps will bear practically no thermal shock, as to try to explain why a few pulps die under live tooth attachments for bridge work. There is one thing that we shall always be uncertain about and that is the vitality of the pulp of any tooth. Just as other parts of the body have high and low vitality, so do the pulps of the teeth, and it occurs to me that in some of these cases the death of the pulps would have been a very natural consequence following a very little injury to the tooth.

Dr. OTTOLENGUI moved a rising vote of thanks to Dr. Ward.

(The motion was carried.)

Adjourned until the afternoon session at 2 o'clock.

(To be continued.)

Maryland State Dental Association.

Annual Meeting, held at Baltimore, Wednesday, Thursday, and Friday,
June 11, 12, and 13, 1919.

(Continued from page 1014.)

WEDNESDAY—*Evening Session.*

(Continued.)

Dr. PARSONS. We will now hear from Dr. R. R. BYRNES of Richmond, Va., on "Business System in Connection with Office Practice."

[This paper is printed in full at page 1078 of the November issue of the DENTAL COSMOS.]

DISCUSSION.

Dr. Parsons. This is a paper that deals in a very full way with a matter that has been very close to our hearts and pockets, as the doctor suggests, for a long time—one which I think is going to do us all good—and I want to hear some expression of opinion on this matter.

Dr. Geo. E. Hardy, Baltimore. It is a well-established fact that the average professional man is a poor business man, and perhaps the members of the dental profession excel all others in this respect. As Dr. Byrnes says, he is usually satisfied with the knowledge of his daily or monthly earnings, and is entirely ignorant of his expenses. Personally, I must confess to gross ignorance of real bookkeeping. What I do not know about the subject would fill a larger book and many more columns than the big book shown by the essayist tonight. I feel real embarrassment when I look at the various charts and listen to Dr. Byrnes' explanation of them, and compare his system with the crude method that is practiced in my office. Not that my method is entirely without merit, for I

do keep a very accurate account of my daily charges and collections, and can tell at any moment the amount of outstanding accounts and the daily collections; but so far as overhead or operating expenses, personal and living costs, and income from other than professional sources are concerned, my system, to say the least, is incomplete. The average busy dentist is too tired when his day's work is done to do more than charge up his work and give credit for collections. Lack of time and lack of previous training, then, is our excuse. I, for one, am too old and too busy to take a course of study in bookkeeping. The only solution I have to offer is to employ a competent secretary and bookkeeper. The system shown us tonight and explained by the essayist is certainly a most accurate one, and he says is simplicity itself. My lack of knowledge makes it look rather formidable to me, but I know as far as Dr. Byrnes is concerned it is absolutely practical and simple. I have visited his college office and know he follows absolutely the advice he has given us tonight. Every item of expense and income is accurately noted, and a balance can be run off at a moment's notice. The fact that the essayist had acquired a thorough knowledge of practical bookkeeping before he took up the study of dentistry makes this easy for him, and it also enables him to speak to us with authority. I am anxious to see his paper published, for I am sure we can get much real help from a careful study of it.

I know of no other subject connected

with our profession of which we are more ignorant or which is of more vital importance, and I hope Dr. Byrnes' paper will awaken the interest it deserves.

Dr. H. E. Kelsey, Baltimore. I had the honor, as chairman of the Essay Committee, of finding both the essayists for the evening, and am sure from the way their papers have been received I can justly say it is an honor.

I want to say a few words in regard to the subject of this latter paper. I have a system of accounts that is somewhat similar to that described by the essayist, although I believe a little study of Dr. Byrnes' system here would improve what I have been using. I may say such a method as I have in use in my office, any of us could understand, and I think anyone could understand this, and I believe once understood it would be more intelligible than what I have. The system I use was devised also by an expert accountant for dentists, and I have found it exceedingly useful. I have known to a cent for the last seven or eight years what my expenses were, and what my income was, and can tell to a cent what my expenses since the first of the year were, what my income is. When the twelfth month in the year is finished and the balances are taken off every item—and it is itemized very similarly to Dr. Byrnes' No. III chart—I know exactly under every column what the expenses have been, so that in making up my income tax and such other things as striking balances, determining whether there has been a profit or a loss for the year, etc., it is only necessary to foot up the last column, and you have the whole thing there. It is something that begins the first of January and ends the last day of December, and it is done every day—it certainly is never more than a few days behind, and I want to say that it has been the greatest satisfaction to me to have adopted such a system, and I really believe it saves me a great deal of time. The truth is, since I had this system and had someone to keep it for me I have almost ceased to depend on my memory

for things of this kind; it has been a great help to me in that way. I want to study these charts a little more carefully when the paper is published, and believe I can considerably improve the system I have now. I will say this, that any dentist who does not have the information that some such system will give him must have a very uncomfortable feeling. It has given me a much more comfortable feeling. I want to thank Dr. Byrnes for coming up here and presenting this, and believe that when the members here and those others who will read the published article have given it a little consideration and study, they will understand clearly what Dr. Byrnes has attempted to explain to us tonight.

Dr. C. V. Matthews, Baltimore. I enjoyed Dr. Byrnes' paper very much, and to a certain extent I keep this same record, but I go a little farther in giving the number of minutes that I work for each patient and the number of hours I work each day during the year. A man's working days during the year are only about 200 out of the 365. That is, if he takes a vacation. I fix my minimum charge per hour. When a patient gets in the chair the hour is put down, and when he gets out, the hour is also put down. That is transferred to the patient's card. When his bill is sent, the actual number of minutes in the chair are set forth and the minimum charge per hour is charged, and then I charge for the work what I think it worth. If the minimum charge is more for treatment and things like that, he is charged with the minimum charge per hour; then the work is figured up at a fixed price per filling or crown, or whatever it may be, and if this should come to more than the minimum charge per hour, he is sent a bill for said amount. In this way you never work for less than your minimum charge. If you are figuring on your actual time as your salary, and you only have 200 working days in the year, and so many hours per day, you have to have a minimum charge per hour, and then you can make your allowance accordingly.

I enjoyed Dr. Byrnes' paper exceed-

ingly, and, as Dr. Kelsey said, when it is published I will see if I can improve on my system.

Dr. Evans, Washington. I do not know that I can add anything to what has already been said, but we all know—it is self-evident—that the professional man does not pay any too close attention to matters of this sort. I do not know that very many of us have had the opportunity to follow along such wonderful lines as Dr. Brynes has shown us here. Of course I copied those first two charts while he was talking, because I thought I could find some things of great benefit in them to consider. I cannot tell just how closely in my active, practical work I may be able to stick to such a definite system. Chart No. III (distribution of expenses) seems to go into things so deeply that personally I do not know whether I could include that unless my secretary could manage to keep it for me. There is one thing I wanted to ask Dr. Brynes about item No. 6 "Inventory," *i.e.* "value," item 5, multiplied by "cost." I think I understand it, but if he will clarify that a little I shall appreciate it.

Dr. Furfey, Boston. I always make a minimum charge per hour. I always charge by the hour. It is a very bad policy to let a patient realize that you charge him so much an hour, because 20 per cent. of his time and your time, if you do, is spent watching the clock. As a matter of fact we do not get paid what our work is worth, but the people are accustomed to paying more than they once did.

There has not been enough business put into our practice, and men like Dr. Brynes, who have had special training of that kind, are a great help to the dental profession.

Dr. Brynes (closing the discussion). Mr. President and gentlemen, I wish to thank you for your more than courteous consideration of my paper. I am only sorry some of you did not make some unkind remarks to make the meeting more interesting.

Dr. Hardy is just frightened, that is all. This is not a complicated system

at all. The man presenting a system of this kind on paper is at a disadvantage. People go to sleep before he really gets started. The minute you begin to talk figures to some audiences they lose their perspective, their eyes get heavy, and they take comfort in slumber. Personally I cannot appreciate that attitude, because figures are just as essential to my life as the things they represent, which are dollars. Really, the beauty of this system is its simplicity! You don't appreciate that, but it is so. There are really only two charts with which you have to deal, No. I and No. III. No. II is put in as explanatory. I will answer Dr. Evans in time, because, true to system, I must take them in turn, and Dr. Evans comes fourth.

The great comfort I get out of Dr. Kelsey's remarks is that when I see him riding in his automobile or smoking his panatelas, I know he has a moral right to them because he knows how he stands. That gratifies me greatly in the presentation of this paper.

If Dr. Matthews gets 200 working days out of 365 he is "going some." He is working at night, and he is working Sundays. I think I could show you some things, if I really cared to give you some figures here, as to the practical number of working hours. I think, by the way, that Dr. Clapp brings this out in his book "Profitable Practice," which I would strongly recommend as an excellent book. I think you will find, from an accurate record, that if you attend conventions, are really sociable with your brother dentists, and do some charitable work, your earning hours are about 1000. That is a mighty good earning year.

I would like to reassure Dr. Evans about this plan. Here [exhibiting the charts appearing in his paper] is one chart, No. III, that is filled out each month; there is one, No. I, filled out each year. When you get through you have a whole year's work, but you start with a page for January and you wind up with one for December. Thus you have a page for each month. To answer specifically your question, doctor, about items 5 and

6 I did not take that up in the paper because it was necessary to avoid many details. Take "quantities on hand," one column is headed "quantity," and the other has the dollar mark. The quantity column is used down until you come to No. 6. In other words, on the first of the month you have, we will say, 10 lb. of modeling compound; we buy during the month, assuming that we are doing a land-office business, 50 lb., which makes 60 lb. we have had in our possession during the month. If, now, we deduct what we have on hand at the end of the month, which we will say is 20 lb., it will leave, as a result "item 5" *i.e.* 40 lb. We are not concerned with the money until we reach this point. What, now, does 40 lb. represent in money? You know that is exactly what is done in inventorying a stock; they put down half a bottle of ink, etc. and figure the values when the inventory is finished. Item No. 5 is filled by daily purchases, in the left-hand or "quantity" column. I have presented two months here, June and July. This you will notice is June 1st to July 1st, representing a full month, so that the left-hand column under each month would represent the quantities. The last item, or item 6, represents that quantity multiplied by the cost.

This portion of Chart III is the adaptation of Chart No. II so far as the items for which an inventory would be taken are concerned. In precious metals, for instance, my recommendation is that for a while you keep this in detail, and if you find results each month about the

same you are losing time in taking an inventory. This procedure must be determined by the size of the business. For a small business I certainly would not keep the detail, but if you are carrying \$1000 or \$2000, or even \$500 worth of gold, I should certainly want to know where it is going, and this keeps track of the amount of precious metals you are using.

If Dr. Furfey will recall, I said that the time stamp had many objections. Not so in the laboratory, though, for it is never seen by the patient, and my recommendation is to have something to take the place of a time stamp in your operating room. Have the time taken by your secretary, without the patient's knowledge. It may be kept in such a way that the patient will never know it. I cannot go into details as to how that can be accomplished, but there are many ways, and if anyone is interested I can offer him several suggestions along that line. The point Dr. Furfey makes regarding dentist and patient watching the clock is well taken, but this would be overcome if a plan such as I have referred to is followed, one in which neither patient nor dentist need know the length of time consumed in the operation. Time enters into it for the secretary's records only.

Dr. Parsons. I want to thank Dr. Byrnes for this fine paper, and hope we may have him again to talk to us, because it is missionary work that we all need.

The meeting then adjourned.

Forsyth Training School for Dental Hygienists.

Meeting of the Alumnae Association.

THE Alumnae Association of the Forsyth Training School for Dental Hygienists held its fifth annual meeting at the Forsyth Dental Infirmary for Children on July 1, 1919. The meeting was well attended and proved to be highly interesting to all of those present.

Dr. WILLIAM H. POTTER, Boston, gave an interesting talk of his experiences while a member of the American Expeditionary Force overseas. In this address Dr. Potter emphasized oral hygiene as an important prophylactic measure in the army. His experience as oral surgeon with the American Expeditionary Forces afforded unusual opportunities for observation, and demonstrated many truths which will no doubt be appreciated by the dental profession at large.

Dr. Potter stated that much greater resistance to disease existed in those soldiers who practiced mouth cleanliness and whose teeth were in good condition. The dentists worked at high pressure performing emergency operations necessitated by such a huge number of patients. Teeth were extracted and artificial dentures made in an almost incredibly short time. Privates who had been dentists in civilian life were pressed into service as dental hygienists. The prophylactic cleanings performed by these men saved much valuable time for the commissioned D.M.D.'s. They also rendered a much-needed service as instructors and demonstrators of mouth cleanliness to the soldiers. It became very noticeable that oral hygiene greatly diminished liability to "trench mouth." Patients suffering from this disease were materially helped by frequent and thorough cleansing of the oral cavity.

It was observed that surgical operations were less frequently followed by pneumonia if the patient's mouth had received a thorough prophylactic cleaning before ether administration. This is readily appreciated when one remembers that prophylactic cleaning can reduce pneumococci and other mouth organisms to a minimum.

As might be expected, oral cleanliness was also very important in treating wounds of the mouth. Infection was prevented, or at least diminished, by removal of all food debris and accretions from teeth and surrounding tissues. The healing process was also greatly helped by maintaining perfect cleanliness. Dr. Potter remarked that a truly efficient mouth-cleaning could best be performed by those who had been dentally trained. The medical nurses did well in this line after receiving specific instruction by dentists, but much valuable time and effort might have been saved had dental hygienists been available. We feel grateful to Dr. Potter for adding his testimony to the importance of our special field, and we are glad indeed to do our part in the advancement of oral hygiene.

Miss EVANGELINE TAINTOR, Forsyth Dental Infirmary Training School 1918, read an interesting paper on her experiences as dental hygienist in the office of the Surgeon-general, Washington, D. C. It was gratifying to note that training received in the Forsyth surgical department had been of great service. As might be expected, those dental hygienists who were already familiar with oral surgery could take hold and do efficient work in this line, in addition to their other duties. The thoroughness

and efficiency of the dental hygienists' prophylactic cleaning caused much favorable comment. Dental hygienists may well feel encouraged at the ever-increasing appreciation of their work. The United States Government has now shown still further recognition of their worth by establishing a civil service examination through which appointments may be obtained. We may justly expect that the dental hygienist, like the trained medical nurse, will in time be employed in every field where efforts are made to maintain and establish good health.

Dr. HAROLD DEWITT CROSS, director of the Forsyth Dental Infirmary, spoke on the benefits of membership in the Dental Hygienists' Alumnae Association. He proposed that all graduates become members, and that a state association be

formed when greater numbers should make this possible. It was to be regretted, said Dr. Cross, that all graduates had not joined the Alumnae Association. They were missing opportunities for development through the educational program of lectures and through contact with the best representatives of the dental profession. It was suggested that a printed letter be sent to each graduate, pointing out the need for greater co-operation and the mutual benefits to be derived from their membership in the association. It would be necessary, of course, to follow up the letters by personal efforts. Dr. Cross's experience in alumnae organizations made his remarks of very practical value, and we feel sure that good results will follow.

A. E. CHRISTIE, D.H., *Secretary*.
BOSTON, MASS.

THE DENTAL COSMOS

A MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDWARD C. KIRK, D.D.S., Sc.D., LL.D., *Editor.*

L. PIERCE ANTHONY, D.D.S., *Associate Editor.*

PUBLISHED BY THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA, PA.

ORIGINAL CONTRIBUTIONS, society reports, and other correspondence intended for publication should be addressed to the EDITOR, Lock Box 1615, Philadelphia, Pa.

Subscription price, postpaid, to all parts of the United States and Possessions, Cuba and Mexico, \$1.00 a year; Dominion of Canada, \$1.40 a year; other countries, \$1.75 a year.

Subscriptions may be sent through dental supply houses, subscription agencies, or direct to the BUSINESS MANAGER, Lock Box 1615, Philadelphia, Pa.

Communications relating to advertising should be addressed to the BUSINESS MANAGER, Lock Box 1615, Philadelphia, Pa.

PHILADELPHIA, DECEMBER 1919.

EDITORIAL DEPARTMENT

Audi Alteram Partem.

WE devote considerable space in this issue to an exploitation of the views of several members of the dental profession who are opposed to the legalization of the dental hygienist. We do this because we believe their opinions should become matters of public record and because it is a fundamental policy of the DENTAL COSMOS to deal fairly and judicially with both sides in any controversy, especially one which involves such important and far-reaching consequences both to the dental profession and the public as does the one under consideration. The essayist, whose paper before the Pennsylvania State Dental Society formed the *pièce de résistance* and storm center of the discussion, came, by invitation, to endeavor to accomplish in Pennsylvania what, according to his

own admission, he failed after many years of endeavor to accomplish in Massachusetts, viz., to prevent the legalization of the practice of the dental hygienist. A careful study of his presentation of the case against the dental hygienist, we respectfully submit, creates the impression that the essayist realizes that he is fighting for a lost cause or at any rate playing a losing game. The use of sarcasm, ridicule, vituperation, the imputation of dishonest motives by a disputant, are neither argument nor logic, but they are, on the other hand, unmistakable evidences of adherence to a weak cause.

Divested of these irrelevant features, which befog both the essayist's presentation and much of the discussion thereof, the argument, if it may be so designated, reveals the conclusion that no objection is made to the legalization of a properly educated and trained dental hygienist. Very well and good! The question then is not on the licensing of "manicurists," "typewritists," office assistants *et id genus omne* as dental hygienists but of persons properly trained and equipped for the service intended.

Is there a need for such a public health specialist? When in 1913 Charles Mayo expressed the belief that the next great advance in preventive medicine should come from the dental profession and doubtfully added, "Will the dentists take the step?" he may or may not have had specifically in mind the unlimited field of oral hygiene. Be that as it may, it has now materialized that oral hygiene is that "step." The dental profession is squarely face to face with the question whether it can and will meet the demand that confronts it or whether it will not. To say that the dental profession should "unite and conduct an active campaign of education of the public in matters affecting the health of the mouth" is all very beautiful and idealistic but wholly a Utopian conception. Some dentists will if they are properly compensated, but the majority are even now overloaded with the burdens of the service they are rendering to that portion of the public who are able to pay for the service rendered. In the meantime the vast field of oral hygiene education and service in the public schools, in industrial establishments, hospitals, reformatories and eleemosynary institutions, is awaiting and demanding the benefits of training and service in oral health. The dental profession as at present organized is wholly inadequate for the task before it. So mani-

festly is this the case that already the problem has become the subject of national legislation in England, and in more than a dozen of the states of our own country it is the subject of statutory enactment. The underlying and significant thing in relation to the oral hygiene situation is the general tendency upon the part of the state to take over oral hygiene service as a definite department of the public health service regardless of the astigmatic views of a minority of the dental profession, who fear that state provision for public oral hygiene service will result in a diminution of their individual incomes.

The problem of educating and training the dental hygienist is one requiring careful thought and consideration in all of its aspects and should be wrought out by dental educators of seasoned experience. It is no more than natural that the first attempts at the creation of a satisfactory curriculum should be faulty and subject to improvement. Like all educational processes, the problem of educating the oral hygienist is a developmental one. Likewise the confining of the activities of the hygienist within the limitations imposed by the content of the curriculum is a problem of legislation which, if intelligently conceived, will constitute a sufficient safeguard against illegal practice. That the legal practice of the licensed hygienist will ultimately depend much upon his or her individual conscience and honesty does not constitute an element of weakness in the demand for the creation of that type of public servant, for the same consideration applies equally to the licensed dentist as experience has abundantly shown. There should be no mistake in reading the signs of the times, for the handwriting is already on the wall. The "next step" in preventive medicine is public oral hygiene service. If the dentists do not take the step either because they cannot or because they will not, then the state will do so, as it is already doing in the interest of the public welfare and with the dental hygienist in some form or other as an efficient adjuvant of the dental profession to that end.

Dr. Nathaniel Gildersleeve.

WE regret to announce the death of Dr. NATHANIEL GILDERSLEEVE of Philadelphia, on November 11, 1919. A full obituary notice will appear in the January 1920 issue of the DENTAL COSMOS.

PRACTICAL HINTS

This Department specially welcomes the brief presentation by our readers of any novel suggestions or methods which in their own practice have proved to be time-saving or to possess other features of advantage.

To Prevent Corrosion of Metal Syringe Tripods.

By J. ARONSON, D.D.S., Bronx, N. Y.

THE legs of the metal tripod that comes with some syringe jars become corroded by the glycerin-alcohol solution. To prevent this, cut off the proper lengths of glass tubing and fuse one end. Cement a tube on each leg, and you have a non-corrodible tripod.

Immediate Plate Repair.

By ALBERT NAHAS, D.D.S., Alexandria, Egypt.

WHEN owing to a mishap in vulcanization one of the molar teeth is found to have become so elongated as to preclude proper articulation, an immediate repair in the regular way is unfair to the patient, and quite inconvenient to the dentist. The following is a simple way of evading both extremities and getting a satisfactory result besides: Warm the offending tooth and prize it out of the plate; in the rubber socket insert an ordinary amalgam filling, and carve to suit articulation; polish thoroughly with pumice and rouge to finish, and you have a very efficient substitute in a short time.

REVIEW OF CURRENT DENTAL LITERATURE

[*Lancet*, London, July 5, 1919.]

Eye Color and the Abnormal Palate in Neuroses and Psychoses. BY H. LAING GORDON.

This report is part of an inquiry, the opportunity for which was afforded by the examination of a large number of discharged soldiers in whom susceptibility to neuroses and psychoses had been demonstrated only by its actual results. Gordon's conclusions are:

(1) In individuals who are susceptible to neuroses and psychoses, *duplex* eyes (black, brown, hazel, yellow, green, impure gray, and intermediate shades) are more than twice as common as *simplex* eyes (always some shade of pure blue or pure "gray"). (2) In the same class of individuals the *narrow* and *abnormally arched* palate is present in about 52 per cent. of cases. (3) In the same class again, the proportion of duplex eyes to simplex eyes is markedly increased in those cases with narrow and abnormally arched palates, and the increase tends to be intensified along with the intensification of the palatal deformity.

Even if the proportion of simplex to duplex eyes given does not vary from the general proportion in the population of England, and even if the abnormal palate is a British characteristic, whatever its cause, the interest of the third conclusion remains sufficiently suggestive for further investigation on a larger and more complete scale.

[*Medical Record*, New York, August 2, 1919.]

Focal Infection as a Cause of Painful Heel. BY SIGMUND EPSTEIN.

Epstein discusses three causes of painful heel (podalgia)—those due to tonsillar infection, those secondary to oral infection, and the gonorrheal heel. In regard to the tonsillar origin, he recalls that the tonsil is a

clearing station for mouth infections, and that tonsillar attacks are often due to dental troubles. Three cases of dental interest are given:

Case 3. A man of forty-nine. A vicious infectious osteoarthritis of both metatarsophalangeal big-toe joints. The onset was with grip and tonsillitis. He was in bed six weeks and on crutches four more. The condition was diagnosed as gout. A loose, infected molar was extracted, and the feet placed in plaster-of-Paris bandages. Marked relief immediately; "practical resolution" in ten days.

Arthritides and osteoarthritis are common from dental infection, but distinct calcaneal periosteitis has not been, in Epstein's experience, as common. In this light the two following cases are of interest:

Case 5. Man of thirty-seven. Heels began to hurt two weeks after a tonsillitis, and the pain continued for six months. A "small sinus" was found above a maxillary second molar, which tooth was extracted. Prompt relief from pain.

Case 6. A man of thirty. Pharyngitis and tonsillitis; three months later a gradually increasing lumbar backache, with painful swelling and aching of heels and soles. Suspicion fell on a crowned left molar and "dusky" tonsils. After appropriate dental treatment all pain disappeared, showing a remarkably prompt response to the removal of the source of focal infection.

[*Journal de Méd. de Bordeaux*, June 25, 1919.]

Cure of Neuralgia Under Fixation Abscess. BY ROUMAILLAC.

There is here reported a case of a woman, age thirty-four, a neurasthenic, with high blood pressure: for one period had albuminuria: viz, 9 grams per liter during concluding months of pregnancy, then 2 grams during three years immediately following delivery,

and finally complete disappearance of albumin for the past fifteen years. Severe unilateral (right) trigeminal neuralgia; supra- and infra-orbital, and dental and gingival points of hypersensitivity; eyeball very painful; occipital nerves seemed involved. Onset sudden, lasting a half to a full hour. Patient complained of odontalgia, but dental attention brought no relief. All the medicaments usually used in such cases applied, without effect. Finally Roumaillac tried treatment by fixation abscess, a method which seemed indicated because the condition seemed attributable to an autointoxication from renal insufficiency. One and a half cc. of old yellow turpentine was injected into the antero-external surface of the left thigh. Violent reaction. The neuralgia ceased immediately and completely, and has not returned during the five years which have since elapsed.

[*Pennsylvania Medical Journal*, September 1919.]

Some Influences of Diet Affecting the Second Dentition. BY JOHN F. SINCLAIR.

To improve the teeth of the future generations it will be necessary to begin with the pregnant mothers, and supervise their diets so that they may have a well-balanced ration in excess of their usual food requirements, to the end that both mother and child may not lack needed nutriment for perfect growth and development. This careful dietetic oversight and management must follow the nursing mother and her child until weaning is accomplished, after which the child must be still further properly directed from the standpoint of diet. The infant should always have breast milk from birth until the seventh or eighth month, if it is at all possible. When weaned a properly modified cow's milk should be employed. During the second half of the first year of life vegetables and fruits, thoroughly cooked and comminuted carefully by mashing them through the meshes of a fine wire sieve may be given with advantage. Juices of fruit, such as oranges, prunes, peaches, pears, or pineapple may be given as early as the second month, always beginning with small portions, a teaspoonful. With the appearance of the deciduous teeth, food requiring chewing should be given to the child. Dry crusts of bread, zwieback, toasted bread, the coarser cereals,

meat and meat bones; and later, green salad leaves, cooked celery, spinach, peas, cauliflower tops, asparagus tips, string beans, and apples.

[*Gazetta degli Ospedali e delle Cliniche*, Milan, February 9, 1919.]

Staphylococemia Simulating Typhoid with Relapses. BY U. BACCARANI.

Only one case is of direct dental interest. A girl of eight years, with fetor of breath, exhibited in the gingival mucosa of the right side a small superficial ulceration with a covering of pus. This healed in about three weeks. About this time the child suffered with a chill, followed by a very high fever, lasting about twelve days, gradually decreasing to disappearance. Anorexia, marked diarrhea, and the "*facies typhosa*" present. The condition was diagnosed as typhoid fever. After a few days of apparent convalescence, there was a return of the fever, with meteorism, diarrhea, and dulled senses. This second attack lasted a little more than a week. This was followed by a third attack. The oral cavity had returned to normal conditions. A Widal test was negative. Finally a suppurative periosteitis and osteomyelitis of the right tibia manifested itself. With resolution of this, the general condition immediately cleared up.

Baccarani evidently looked upon the tibial infection as secondary to the gingival ulcer. The chain of causality in the above history does appear rather weak, but Baccarani's thesis is somewhat strengthened when this single case is considered in connection with the others detailed in this article.

[*British Journal of Surgery*, July 1919.]

Acute Necrotic Parotitis. BY V. ZACHARY COPE.

Cases of this type of parotitis first came to Cope's attention in Mesopotamia. While bacterial infection with staphylococci or streptococci was always the immediate exciting cause, yet the more important element in causation was the predisposition induced by excessive heat (five of the seven cases occurred when 120° F. was a common shade temperature) or debilitating diseases. Though the mouth was seldom dirty, it was as a rule drier than usual, as would be expected during such extreme heat. (Compare Deaver and

Collins, DENTAL COSMOS for May 1919, p. 425, as to oral dryness as a predisposing factor to postoperative parotitis.) The parotitis may be bilateral or unilateral. The condition leads to severe general toxemic symptoms, which result fatally unless there is prompt surgical intervention. Treatment by very free incision and drainage of the affected parotid gland is of importance.

[*Journal of Dental Research*, Baltimore, June 1919.]

A Contribution to the Knowledge of the Development of the Submaxillary and Sublingual Salivary Glands in Human Embryos. BY KURT H. THOMA.

Most of the previous studies of this nature have been done upon sections cut in the *frontal* plane through the head. In Thoma's opinion, serial sections in the *sagittal* plane seem more promising, and consequently this contribution is based for the most part upon such material. Sagittal sections give a clearer idea of the direction of the developing glands, their ramifications and relation to adjoining structures in the mouth. The further purpose of this study was to furnish more complete data concerning the time of development of the anlagen of the submaxillary, sublingual minor and major, the anterior lingual and the labial glands. Special attention was given to the place from which the development of the anterior lingual gland starts, as Schulte (George Crocker Special Research Fund, iv, Part II) found in embryo 325 of the Columbia University collection a sprout mesial from the submaxillary anlage, which he thinks may form the anterior or apical gland of the tongue (Nuhn-Blandin). The time, location, and frequency of the development of accessory and secondary lobes of the submaxillary gland promised another interesting study, to which sagittal sections are specially well adapted. Most of the material was supplied from the Harvard Embryological Collection, although the heads of a few embryos had to be specially prepared for the more advanced stages.

To a certain extent it will be interesting to compare Thoma's conclusions with those reached by Hans Moral ("Early Developmental Stages of the Submaxillary Gland and Early Development of the Parotid Gland,"

published in 1912 by J. F. Bergmann at Wiesbaden, and abstracted in *Deutsche Monatschrift f. Zahnheilkunde* for January of 1914, ss. 70-2), as the work has been done independently. The ages of Moral's material and the method of preparation are not available.

Thoma states that the younger embryos show that the anlage of the parotid gland is developed first, being quite definitely formed in the embryo of 10 mm. length. Moral came to the conclusion that the parotid was preceded by the submaxillary and followed by the sublingual in the initiation of its development.

Thoma believes he recognizes the submaxillary gland in an embryo of 10.2 mm. length. Branches are first noticeable in the 20 mm. embryo, in which they have already acquired appreciable length. The epithelial sprout which forms the anlage of the submaxillary gland is given off from the lingual sulcus at the posterior end of an epithelial comb, just behind the lingual nerve, where the latter becomes infiltrated by the cells of the submaxillary ganglion. (This in general is in agreement with Moral.) In older embryos the ducts first extend down ventrally, inclined toward the median line, and, after running a short course, curve caudad and toward the side. On account of the general growth of the mouth the orifice is moved considerably forward and the duct becomes elongated. Soon after crossing the submaxillary ganglion, through which the lingual nerve passes to enter into the tongue, it curves ventrad around the mylohyoid muscle, where it gives off various branches. Here the anlage of the gland body is formed. It consists of proliferating epithelial sprouts surrounded by a capsule.

The accessory and secondary submaxillary glands form lobules resembling, except for their smaller size, the main gland. They are also surrounded by a capsule. The secondary glands are located anteriorly to the submaxillary ganglion and the mylohyoid muscle and have a duct of considerable length.

The greater sublingual (Bartholinian) glands develop at a still later period, the first well-defined anlage being seen in the 22 mm. embryo. They grow much more slowly than the submaxillary glands, but the ductus sublingualis major forms a lumen early. It is either given off from the submaxillary duct

at its very beginning, or is formed separately from the epithelial comb directly anterior to and lateral from the orifice of the submaxillary duct. It may be present on only one side of the embryo. In two cases out of six, it occurred on both sides, in two on one side, and in two cases it was entirely missing.

The lesser sublingual glands are also found in the embryo measuring 22 mm. In the younger embryos they are seen developing from the anterior part of the epithelial comb. Later sprouts are also found to be given off from the posterior part of this structure (31 mm. embryo). In older specimens buds are seen still farther back, given off from the oral epithelium. The anterior ones develop earlier and grow to a larger size than the latter. There may be between ten and twenty sprouts. They form short branches on all sides along their ducts. These in turn form secondary ducts, on which the alveoli develop.

The anterior lingual glands are noticeable for the first time in the 62 mm. embryo and develop from sprouts originating from the epithelium on the ventral surface of the tip of the tongue. They apparently start without any accumulation of epithelial cells or an epithelial ridge and are found on both sides of the mid line. At this age the epithelial cord which is to be their duct shows no lumen yet, but an enlargement has occurred at the end, forming the anlage of the gland body.

The labial glands develop simultaneously with the anterior lingual glands. In the 62 mm. embryo, from twenty to thirty sprouts could be seen in the various sections through the lower lip. They appear as epithelial cords with enlarged endings. A lumen has not yet formed, nor can any branching be seen at this stage. In a specimen of about 230 mm. there are a great many of these labial glands, of large size. Their ducts seem to describe tortuous curves before reaching the oral epithelium. The lumina of the ducts extends far into the alveoli, where many mucous cells have already been formed.

In respect to the formation of the lumina of the ducts of these glands, Moral is very emphatic that the lumina of both the parotid and the submaxillary glands do not result from the disintegration of the centrally placed cells, but rather from a separation

of these cells. Thoma implies this latter mechanism.

Both Thoma and Moral essentially agree that the connective tissue capsule which surrounds the epithelial tissue is called forth in response to the proliferating, invading ectodermal cells; that in the early stages the capsule seems significantly larger than the gland itself; and that when branches are developed from the epithelial anlage of the gland they in turn call forth a reaction in the surrounding mesenchyma, resulting in the formation of septa in which bloodvessels and nerves are found. (Moral describes the presence of many nerve-fibers, while Thoma mentions their presence as being occasional.)

[*Bull. et mém. de la Société méd. des Hôpitaux*, Paris, May 29, 1919.]

Bilateral Syphilitic Parotitis with Facial Paralysis of the Left Side. By A. LEMIERRE.

Syphilis of the salivary glands is a relatively rare affection. Two months before Lemierre saw this patient (a man of twenty-two years) the trouble began without fever, malaise, or any trouble in his general health, first in the left parotid and three days later in the right. No pain. One month after the beginning of the trouble facial paralysis of the left side (peripheral type) set in. On examination, the glands were as hard as wood; pressure provoked no pain; integument normal; no edema or reddening; no dysphagia; no trismus; no dryness of mouth; no swelling of submaxillary or sublingual glands; orifices of Stenson's ducts normal. By reason of the bilaterality of the lesion and in spite of the facial paralysis, Lemierre excluded diagnosis of neoplasm, and decided that the condition was of an inflammatory nature. Potassium iodid was given. In four days, the parotids began to diminish in size, and in a week the facial paralysis was less complete. In about seven weeks from the beginning of treatment, there was no trace either of the parotitis or of the facial paralysis. Sanz (*DENTAL COSMOS*, December 1918, p. 1160) reports a case of facial paralysis in a syphilitic. The patient was affected with a "mercurial" stomatitis, which infected the parotid, the swelling of which mechanically compressed the facial nerve.

[*Annals of Surgery*, Philadelphia, October 1918.]

Operative Treatment of Trifacial Neuralgia. BY WILLIAM SHARPE.

No doubt carious teeth with root abscesses and sinus infections may originally be factors in predisposing to trifacial neuralgia, but in Sharpe's series of patients it seems that these dental and sinus lesions were but incidental and not in any way etiological factors.

The alcoholic injection of the Gasserian ganglion cannot be too strongly condemned, as it is, in Sharpe's opinion, of greater danger to the life of the patient and the probability of serious complications so much graver than the major operation itself.

For those patients in whom all medical treatment and peripheral nerve operations have failed, there is indicated the evulsion of the ganglion's posterior sensory root from its origin in the pons. By this means permanent relief of pain can be assured to the patient. The technique of the operation is given in some detail.

The closing paragraph of this contribution is of some significance. Three patients have each had a definite bony protuberance arising from the upper portion of the anterior surface of the petrous bone and extending apparently into the outer edge of the Gasserian ganglion, so that in order to approach the ganglion it was necessary to use a small chisel to remove the bony obstruction; at its inner side lay the ganglion. This bony process or possibly exostosis has been observed in several other patients and it may possibly be a factor in producing the condition of trifacial neuralgia which is always unilateral; the irritation of the ganglion by its direct or indirect pressure may be a primary cause of the conditions; it is significant in three of the patients, that the pain originally began not in one branch but in two or three branches. This condition of a possible exostosis as a primary cause of some cases of trifacial neuralgia should be considered.

[*Proc. Royal Society of Medicine*—Section of Laryngology, July 1919.]

Perithelioma of Right Maxillary Antrum: Radium Treatment. BY J. GAY FRENCH.

The patient, a woman of forty, noticed a small growth in the right nostril. Radium

treatment was carried out daily for two months. Ten months later a "polypus" was removed from the same nostril. A month later the "polypus" began to grow rapidly, and in the two successive years, twelve operations were performed. The "polypus" became inflamed. Radium was applied continuously for forty-eight hours, with some improvement for one month, followed by increased growth. The patient complained of headache, a continuous nasal discharge, with complete loss of smell. Finally a large amount of polypoid-looking material was removed by French from the right naris and antrum. At present the patient is being treated by radium. Histologically, the tissue removed showed a densely cellular mass, rapidly growing and certainly malignant. In parts the growth consists of a dense collection of round cells, resembling an atypical sarcoma. In other parts the cells are oval, and form spaces filled with blood, suggesting that the growth arose from some tooth structure, and is really epithelial in origin.

[*Pacific Dental Gazette*, April 1919.]

Enlarged Thyroid Due to Impacted Third Molar. BY A. B. FRENCH.

Case, male, age twenty-two years, weight 130 lbs., height 5 ft. 8 in.

All third molars, except mandibular right, had erupted. The thyroid gland on right side extensively enlarged so that it interfered with speech. Treatment for the enlarged thyroid showed no improvement. This treatment was discontinued and the right mandibular third molar was extracted. Improvement in the patient's general condition was noticeable in ten days, and in six weeks there was a marked decrease in the size of the thyroid. Fourteen months after the extraction, the enlargement can only be noticed by the closest observation and would not be suspected except for the knowledge of its previous existence.

French ascribes the enlargement solely to the local nervous irritation set up by the impacted tooth.

(*Cf.* E. H. Reede, *DENTAL COSMOS*, 1916, p. 1318, and G. Bilancioni, *DENTAL COSMOS*, 1917, p. 466. In the cases reported by these authors, the relation between the dental condition and the enlarged thyroid was of an infectious nature.)

PERISCOPE

Plate Polishing.—Metal plates will take on a very high luster when a little aqua ammonia is used in mixing the chalk instead of water. Vulcanite will take on a mirror polish if the finishing is done by the use of tin oxid made into a paste with glycerin. In either case a clean buff should be chosen, and kept exclusively for this purpose.—*Dental Record*.

Removal of Rust from Steel Instruments.—To remove rust from steel instruments, Sangu recommends placing them over night in a saturated solution of zinc chlorid. The rust disappears through reduction. On removing the instruments they are to be rinsed in clear water, placed in hot soda and soap solution, and dried. It is also advantageous to polish with absolute alcohol and chalk.—*Pacific Medical Journal*, per *Dental Surgeon*.

Post Protection in Difficult Cases.—It frequently becomes necessary to contour a tooth stump with amalgam before it can be crowned. In building up such a stump, the metal post or posts should be protected against the action of the free mercury found in the amalgam. After the post has been cut to shape and notched as desired, paint it with a very thin coat of cavatine. This will eliminate all danger of the post disintegrating from contamination.—ALLEN C. PRATHER, *Pacific Dental Gazette*.

The Metric System.—A serious effort is being made by the supporters of the metric system to have the United States adopt the metric units of weights and measures. Nearly every civilized country, except the English speaking, has adopted the metric system, and during the late war American manufacturers were forced to use the metric system in the manufacture of guns and other ordnance. The two principal American locomotive manufacturers had to use it in the building of their product. If the work on the blue prints had had to be done in feet and inches the locomotives would never have been built. Perhaps the Anglo-Saxon aversion to change would be overcome were it generally known that our measurements by ounces, quarts, etc., had their origin in Germany.—*Oral Hygiene*.

Correcting Articulation.—A very easy and good method for locating the high points in a faulty articulation or on porcelain teeth that do not take the carbon stain from the articulation paper, is the use of a rather soft and sticky black wax. This wax is manufactured for the boxing of impressions in denture work. Coat the occlusal surfaces with a thin layer of this wax, then spread it evenly by passing a blast of hot air over it, or in case of a denture, pass the teeth over the alcohol flame. Allow the patient to masticate on this coating of wax as he would on food. The high spots that will show through this black wax can be easily seen and then reduced by grinding with small carborundum stones. Remelt this same wax, and repeat the operation as often as necessary to get the desired articulation.—*Pacific Dental Gazette*.

Mounting Dental Films.—At each corner of the film negative a small area of the emulsion is scraped away with a knife or chisel. To each of these scraped surfaces a minute drop of celluloid cement is applied, and the film immediately cemented to the smooth surface of a strip of frosted celluloid backing, pressing the corners down for a few seconds in order to facilitate attachment to the cemented corners. By using the fingers for this, sufficient warmth is imparted to hasten the setting of the cement.

The cementing material is easily prepared by dissolving discarded films in acetone, and diluting to a syrupy consistency by the addition of more of the solvent. This solution is then filtered through cotton, and about one-tenth volume of 98 per cent. alcohol is added. This acts as a retarder to the setting. As the solvents used in this solution are very volatile, it will be necessary to keep the mixture in a well-stoppered bottle. It may be thinned as required by the addition of more acetone.

Celluloid backing suitable for the purpose may be purchased in large sheets, and cut to any desired size. It is a good plan to allow a margin sufficiently large to accommodate some descriptive matter.—E. B. KNERR, *Oral Health*.

Arch Form.—In the discussion of arch form, it should be borne in mind that we are considering arch form alone, and not the relationship which the arches bear to the rest of the skull. This is important, for unless this point is clearly emphasized, our vision is apt to become clouded and confused by instances of prognathous arches which at first sight might be construed as being architecturally entirely different from what we consider as being normal. A favorite example of such an arch quite popular with the exponents of the "variations according to type" theory is the Fan Tribe of West Africa. Even if such arches should prove to be different, they should not materially affect our conclusion, for probably none of us will ever be called upon to do restorative work for members of the Fan Tribe of West Africa, nor will we care to reproduce in our patients such an occlusion. Even those who will cling to the theory of type and temperament must admit that our interest is centered upon arch form as we see it in normal, well-developed Americans.—J. D. McCoy, *Oral Health*.

Advantages of Nerve Blocking by Conduction Anesthesia.—The advantages of this method are many, but the following will serve as suggestions of some of the most important:

(1) The long duration is of great value, and is important, if not the most important for the removal of impacted third molars, reducing fractures, treating the antrum, root amputation, removal of tumors, cavity preparation, removal of pulps, sealing teeth, in the observation and practice of the oral surgeon and general practitioner.

(2) Can be used with perfect safety on alcoholics and habitual drug users.

(3) Large and small areas may be anesthetized.

(4) Infected and inflamed areas may be blocked by anesthetizing nerve branches at a point some distance from the operative field and in healthy tissue.

(5) When skilfully made, nerve-blocking injections are done without any appreciable pain.

(6) One or two insertions of the needle will block the operative field, depending, however, upon the nature of the operation and the area to be blocked.

(7) Co-operation of the patient. It is well known that this is of material advantage to the operator, because he can operate with ease and complete the operation on the patient with a minimum of laceration, and without the loss of much blood and mucus.—G. N. KEELING, *Texas Dental Journal*.

Municipal Appropriations for Free Dental Clinics.—The city of Rochester, N. Y., has appropriated \$20,000 per annum for the work of the dental hygienist and lectures in its public schools. This in addition to the work of the Rochester Dental Dispensary.

Toronto, Canada, has increased its dental appropriation of \$33,000 last year to one of \$40,000 for the coming year.

Newark, N. J., reports an annual appropriation of \$10,000 for its dental clinics, the limit of the law. An amendment has been passed making it possible for cities of the first class to appropriate up to \$20,000 for this purpose, which amount they expect to receive next year.

Detroit, Mich., passed a dental appropriation of \$25,000 for the coming year.

Bridgeport, Conn., with a population of 180,000, is spending \$42,789 for educational, dental hygienist, and reparative work in its public and parochial schools. There are many other points in Connecticut that are rapidly coming to the front with enlarged dental appropriations. This is particularly true of New Haven.

Boston, Mass., is enjoying the benefits of the Forsyth Dental Infirmary without expense to the municipality.—*Oral Hygiene*.

Cavity Preparation for Cast Inlays.—Personally we prefer the long bevel of the enamel in preference to short bevel as used for gold foil work. Here is a point all men agree upon. To successfully follow the Black system of cavity preparation, secure a copy of Black's "Operative Dentistry." Make it your Bible. Study carefully the steps of cavity preparation, and the use of each instrument. Keep them sharp, and when you master the use of them, cavity preparation of the character necessary to successful inlay casting will be much easier for you. How some men prepare cavities with burs alone, or with burs and dull instruments, is beyond comprehension. Men have sent us cavities prepared in ivory, and asked us to cast inlays to fit them. The cavities they prepared were of such a character that it was a physical impossibility to cast an inlay to fit them without changing the preparation.

Our experience is such that we believe some men are looking for a casting technique that will permit a distorted wax pattern, taken from a poorly prepared cavity, which will be invested in a special investment that will correct the distortion, and a special gold that will have the same physical properties as wax, and enter the improperly prepared cavity and give a perfect fitting inlay. If we

were to mention the names of some of the men who presented cavities of the character described, we are sure you would be as greatly shocked as we were. Do not expect the impossible. A perfect inlay can only be made in a perfect cavity. Use the rubber dam, and take sufficient time to make proper preparation. MORTONSON BROTHERS, *Journ. Calif. State Dental Association*.

Dental Education.—Not that we all entirely agree with the education of today. Some of us look with a little concern on the tendency which certainly exists in some quarters to broaden the curriculum at the expense of that practical work which constitutes after all the most important part of dentistry, the training for which seems to us in danger of being made perfunctorily short. It would be a sorry thing if a widened scope of learning should endanger concentration on that fine manipulative work which is demanded at the hands of anyone who is to be a dentist worthy of the name. It is not always the brilliant student who goes on to do brilliant work as a practitioner. For that one needs not only book knowledge, not only a broad foundation and its ancillary sciences, not only character and conscience, not only gentleness and cheerfulness ("these," says Robert Louis Stevenson, "come before all morality; they are the perfect duties," and if that is true of anybody, it must be true of the dentist); one needs above all the ability to perform delicate and often very difficult operations with delicacy and precision, only to be acquired by persistent and painstaking practice. And that, when all is said and done, is what makes, or should make, lifelong students of us all. It is a truism, but one which bears restating from time to time, that only those can achieve real success who keep an open and inquiring mind, who are always ready to learn, and whose high endeavor to the last is at all costs to do good work for its own sake.—*British Dental Journal*.

Preparation of the Tooth for a Jacket Crown.—In preparing a tooth for jacketing the first step is to shorten the tooth about one to two millimeters, then with thin carborundum disks the mesial and distal sides are trimmed down to the gingivæ, where a slight shoulder or inset is formed. The shoulder should be at right angles to the long axis of the tooth, then the labial or buccal side, as the case may be, is stripped of enamel, and a shoulder formed just under the free margin of the gingivæ; then the lingual side is ground, care being taken to observe the bite, and allow sufficient room for the porce-

lain body. After the four sides are ground in this manner, the shoulder is sharply defined with finely-cut fissure burs, end-cutting burs, and small mounted stones; also with enamel chisels the shoulder is smoothed. When finished the shoulder should be just far enough under the free margin of the gum to make the joint invisible, care being taken to prevent injury to the periodental membrane, which is usually the case when the root is ground far under the gums to hide the cast joint of a pivot crown, the gum being thereby subjected to undue irritation. When properly jacketed the gum tissue will be pink and healthy in appearance, and the periodental membrane will not be injured. The greatest circumference of the tooth must be at the shoulder, and care must be taken that there are no undercuts to prevent the accurate withdrawal of the impression; the smallest shoulder that can be trimmed is sufficient. If there are any undercuts present they may be filled with cement or gold inlay according to the case, before attempting any impression. After the tooth is properly prepared, a copper or aluminum band is trimmed to fit the tooth snugly under the gingivæ. The band should fit one millimeter beyond the shoulder. The band is then filled with modeling compound, heated, and forced to place, is chilled and withdrawn; then the margin of the impression is heated over the lamp flame and forced again to place. The cool compound will then swage the warm compound around the shoulder, and a sharp accurate impression will be the result. Next a mush bite of pink paraffin and wax is taken. The tooth is then dried thoroughly, and a coating of varnish is applied. Varnish is made by dissolving rosin in chloroform. The varnish protects the tooth, and prevents absorption of any of the secretions, also prevents any irritation of the pulp from the cement. The tooth is then covered with a gutta-percha crown, which keeps the gingivæ packed from the shoulder, and protects the tooth until the jacket crown is finished and cemented. The color is selected and the patient dismissed. A cement reproduction of the tooth to be jacketed is made from a modeling-compound impression of the tooth. This is tapered to simulate a root, which also makes it possible to remove it from the plaster cast. Next the cement root should be treated with olive oil or vaseline, and placed in the wax bite. Then the model is poured. Upon separating the model the cement root may be easily removed, and the crown can be made on the cast in the absence of the patient.—HUGH AVERY, *Journ. Calif. State Dental Association*.

OBITUARY

Dr. James E. Quinn.

DIED, September 17, 1919, at his home in Boston, Mass., of pernicious anemia, JAMES E. QUINN, D.D.S.

Dr. Quinn was born in Ireland, April 12, 1848. He came to this country when six years of age. His parents, having settled at Newfields, N. H., he received his early education in the schools there. As a young man he learned the iron-molder's trade and followed that occupation for ten years. He entered the Boston Dental College in 1878 and graduated in 1881. He settled in Boston and continued in practice there until last spring when failing health forced his retirement.

Dr. Quinn was Demonstrator-in-charge of the Boston Dental College from 1881 to 1884. In that year he relinquished this position to devote his whole time to his private practice, which was a large and successful one. Dr. Quinn never married, but always maintained a home presided over by his sister. He is survived by three sisters and two brothers.

Funeral services were held in St. Cecelia's Catholic Church, Boston, September 20th. Interment was in the family lot at Newmarket, N. H.

Mr. Alfred F. Tilly.

WE regret to announce the sudden death on October 15th of Mr. A. F. TILLY, a member of the staff of the DENTAL COSMOS in the capacity of proofreader.

Mr. Tilly was born in Friskney, England, in 1845. He early in life allied himself with the printing business and for several years was associated with the printing house of Eyre & Spottiswoode of London, where, among other important works, he was employed as proofreader on the official catalog of the British Museum Library. Mr. Tilly came to

America in 1883 and located in San Antonio, Tex., where he was engaged on the editorial staff of the *San Antonio Express*. In 1889 he came to Philadelphia and accepted a position with a publishing house as proofreader of medical textbooks. In 1898 he associated himself with the DENTAL COSMOS as proofreader, which position he held until the time of his death.

Mr. Tilly was a high type of Christian gentleman and deeply interested in social problems, being actively associated with rescue mission work in Philadelphia. He was a conscientious, loyal employee of the DENTAL COSMOS where his broad knowledge of the English language and its origins, his large, practical experience, his unremitting studies in the field of philology and his comprehensive grasp of the technical terminology of dentistry combined to make his efficiency as an expert proofreader of the very highest standard of excellence. He will be greatly missed by all who knew him, and particularly so by those who were closely associated with him on the DENTAL COSMOS staff.

"In Memoriam" Resolutions.

Dr. N. S. Jenkins.

At a meeting of the American Dental Society of London, on the 17th of October, 1919, the news of the death of Dr. Newell Sill Jenkins, an honorary member of the society (which took place on board the S.S. "La France" at Havre) was received with profound sorrow and regret, and it was

RESOLVED, That, in view of Dr. Jenkins' eminent attainments in the practice of his profession, this society pays tribute to his memory and extends to his bereaved family sincere sympathy in their affliction;

RESOLVED, That this resolution be sent to his widow and that a copy be sent to the DENTAL COSMOS for publication.

DENTAL LEGISLATION

AND

LEGAL DECISIONS.

FINAL DECISION IN THE CARR CASE.*

IN THE

United States Circuit Court of Appeals

FOR THE SEVENTH CIRCUIT.

No. 2704.

OCTOBER TERM AND SESSION, A. D. 1918.

THE CARR SCHOOL OF PREVENTIVE
DENTISTRY AND MEDICINE,

Plaintiff-Appellant,
vs.

AUSTIN F. JAMES,

Defendant-Appellee,

} Appeal from the District Court
for the Northern District of
Illinois, Eastern Division.

Before BAKER, EVANS and PAGE, *Circuit Judges*.

Appeal from the decree dismissing a petition charging appellee with infringing Patent No. 1,138,355, relating to dentist's tools.

PAGE, C. J.

Errors relied on are that the Court erred in not holding:

- I. That Claim 2 of the Patent in suit is valid and infringed.
- II. That the infringement amounted to unfair competition.

Claim 2 is as follows:

"Tools for the treatment of teeth comprising a series of straight handles, each tool adapted for use upon a predetermined shaped portion of the tooth and each having a cutting edge and a guiding portion, the guiding portion serving to engage with the tooth in advance of the cutting edge to steady the same, and the cutting edge being in the line of the axis of the handle whereby the instrument has no tendency to turn when in use, and planes as contradistinguished from scraping the surface."

* This case has been pending for some time in the Lower Courts and then was appealed to the United States Circuit Court of Appeals, where the above decision was made.

Stripped of all verbiage, the claim is:

First: For a guiding portion of the tool to touch the tooth in advance of the cutting edge.

Second: For a cutting edge in line of the axis of the handle.

I.

The Specifications do not tell how this "guiding portion" is made or where it is or should be located. An examination of Figures 10, 11, 12, 13 and 14 in the Carr Letters Patent, conclusively indicate that the "guiding portion" is not and cannot be definitely fixed anywhere but is merely the necessary contact between the side of the tooth and the side of the instrument. In Figure 14, there is no contact at all and in his testimony, patentee Carr said that in some cases, without proper adjustment of the angle of the cutting bit or blade, there could be no rest or "guiding portion."

In addition to this, the uncontradicted testimony shows that many dentists used the same sort of contact and that resting the instrument against the tooth was, in most cases, unavoidable. It further appears that in this respect there is no appreciable difference between the Carr tools and the construction of the Cravens tools and many others testified about and in evidence, made and used long before the Carr Application was filed.

II.

While on first reading, the language "the cutting edge being in the line of the axis of the handle" seems simple, it will not stand analysis. The cutting edge is a line and if the language means anything, it means that that line, in construction and use, is merely an extension of the longitudinal axis of the handle.

An examination of the Carr tools shows that no tool is constructed on this plan. If any one such tool would be of use in dentistry, Carr did not make it, and one hundred and fifty such tools, as contemplated by appellant for a set, would evidently be purposeless.

If the language means that the line indicating the cutting edge is at right angles with the longitudinal axis of the handle so that the point marking the center of the line would be touched by an extension of the longitudinal axis of the handle, it will be found to be true in only one or two instances in the Carr tools, but it was and is also true in the Cravens, and numerous other tools made and used long before the alleged Carr invention.

What the language was probably intended to mean is that the center of the cutting edge is in line with the longitudinal axis of the handle. An examination of the tools in evidence shows that this is probably true generally and it also shows that in a great majority of the instruments, the cutting edge is so made that in use the tool is not pulled directly toward the operator, but must necessarily be operated by pulling or pushing against the side of the tool. If pulled directly toward you, as a Japanese plane is operated, it would neither scrape nor plane, but would merely scarify the tooth by drawing the cutting edge quartering across it. This would be a useless device.

The decree of the District Court is affirmed.

A true Copy.

Teste:

*Clerk of the United States Circuit Court
of Appeals for the Seventh Circuit.*

ARMY AND NAVY DENTAL NEWS

CIRCULAR FOR THE INFORMATION

OF

Persons Desiring to Enter the Dental Corps

OF

THE UNITED STATES NAVY.

It is contemplated that an examination of candidates for entrance to the Dental Corps of the Navy will be held about January 19, 1920, at Washington, D. C., and San Francisco, Calif. For the information of those desiring to enter these examinations we publish the following circular from the Navy Department. Application forms and further information may be obtained from the office of the Surgeon-General of the U. S. Navy, Washington, D. C.

A candidate for appointment in the Dental Corps of the Navy as an assistant dental surgeon must be a citizen of the United States, between 21 and 32 years of age, a graduate of a standard medical or dental college, trained in the several branches of dentistry, of good moral character, and of unquestionable professional repute.

The application for examination must be accompanied by the following certificates:

(a) Letters or certificates from two or more persons of good repute, testifying from personal knowledge to good habits and moral character.

(b) Satisfactory evidence of citizenship.

(c) Certificate of preliminary education. The candidate must submit a certificate of graduation from an accepted high school or an acceptable equivalent.

(d) Certificate of dental education. This certificate should give the name of the school and the date of graduation, and be signed by dean or registrar.

(e) If the candidate has had hospital service or special educational or professional advantages, certificates to this effect, signed by the proper authorities, should also be forwarded.

The applicant will save unnecessary correspondence if he will make sure when submitting his application that the qualifications enumerated above are clearly and plainly described in his letters or certificates.

After passing upon the credentials of the candidate the Bureau of Medicine and Surgery will issue a permit to the candidate, effective for a stated period, to appear before a board of medical and dental examiners designated by the bureau via the commandant or commanding officer, for his provisional physical and professional examination. The permit will direct the candidate to communicate with the senior medical examiner as to the date and place of examination. Examinations will probably be held at Washington, D. C., and San Francisco, Calif.

THE EXAMINATION.

Dental chairs are supplied, but other instruments and appliances for operative work must be furnished by the candidate.

The examination is conducted in the following order: I. Physical. II. Professional.

PHYSICAL EXAMINATION.

The physical examination is thorough and the candidate is required to certify that he is free from all mental, physical, and constitutional defects.

The minimum height for acceptance of a man 21 years old or over is 66 inches, barefooted. A variation not exceeding 1 inch is permissible if the applicant is in good health and desirable. The minimum weight for acceptance of a man 21 years old is 128 pounds. A variation of 15 pounds, not to fall below 128 pounds in weight, or 2 inches in chest measurement below the standard given in the table is admissible when the applicant is active, has firm muscles, and is evidently vigorous and healthy. A chest expansion of less than 2½ inches in an adult, is a sufficient cause for rejection.

Acuteness of vision must be not less than 12/20 for each eye, unaided by glasses, and capable of correction by glasses to 20/20.

PROFESSIONAL EXAMINATION.

No allowance will be made for the expense of persons appearing for examination.

The tenure of office in the Dental Corps of the Navy is for life, unless sooner terminated by removal, resignation, disability, or other casualty.

All officers of the Dental Corps are retired from active service at the age of 64 years, and when so retired (or when retired from active service for disability or other casualty contracted in the line of duty before that age) receive an annual pay for life amounting to three-fourths of the pay of the grade or rank held by them at the time of retirement, including the increased pay allowed for length of service as explained below.

When an officer has been thirty years in the service, he may, upon his own application, in the discretion of the President, be retired from active service and placed upon the retired list at an annual pay for life amounting to three-fourths of the pay of the grade or rank held by him at the time of retirement, including the increased pay allowed for length of service.

When traveling under orders by other than public conveyance, officers of the Navy receive 8 cents a mile to defray the expenses of such travel performed from point to point within the United States, and when so traveling abroad are allowed actual personal expenses estimated on a liberal basis in accord with the position of the officer, both as regards admissible items of expense and the cost of such items.

For every five years' service the pay of officers is increased 10 per cent. (though not to exceed 40 per cent.), calculated on the annual base pay of their grade.

When an officer goes to sea or leaves the continental limits of the United States under

assignment to stations or for the performance of other duties beyond the seas, his pay is increased 10 per cent.

When two or more candidates are examined at the same time, their appointments will be in order of merit reported by the board.

Officers of the Dental Corps are entitled to all the military courtesies and consideration that go with their rank which are accorded to officers of other branches of the service in a similar grade. They wear the same uniform as other officers of the Navy, with a designating device distinctive of their corps.

Pay and allowance are dependent on grade and length of service and range from that of assistant dental surgeon, rank of lieutenant (junior grade) \$2000 per annum and \$432 allowances, to that of dental surgeon, rank of captain, after 20 years of service, \$5600 and allowances of \$1008.

Assignments.

Army Dental Corps.

Week ending October 18th.

Maj. Nathaniel Barnard to Fort Sheridan, Ill., general hospital 28.

Maj. James B. Harrington to Governors Island, N. Y., for duty.

Maj. Thomas J. Cassidy to Fort Sam Houston, Tex., for duty.

Maj. James L. Miller to Fort Leavenworth, Kan., for duty.

Majs. Benjamin J. Durham and Adolphus E. Worsham to Camp Dix, N. J., for duty.

Capt. Beverley M. Epes to Walter Reed General Hospital, D. C., for duty.

Capt. Adrian C. Ragan to Denver, Colo., general hospital 21, for duty.

Capt. Oscar W. Thompson to Camp Dodge, Iowa, for duty.

Capt. Leslie S. Harlan to Jefferson Barracks, Mo., for duty.

Capt. Ralph O. Leonard to Fort Slocum, N. Y., for duty.

Capt. Arthur C. Foard and 1st Lieut. Raymond E. Robb to Camp Dix, N. J., for duty.

1st Lieut. Cecil R. Hillier to Fort McDowell, Calif., for duty.

1st Lieut. Frank A. Crane to Aberdeen, Md., Proving Ground, for duty.

The following report by wire to commanding general Southern Department for duty: 1st Lieuts. Ralph J. Browne and James W. Young.

Week ending October 25th.

Col. John H. Hess, at Chicago, report to commanding general, Central Department, for duty as department dental surgeon.

Lieut.-col. Robert F. Patterson to Camp Dix, N. J., for duty.

Lieut.-col. Robert H. Mills to Boston for duty as department dental surgeon.

Lieut.-col. John A. McAllister, Jr., to Camp Meade, Md., for duty.

The following to duty at hospitals: Maj. Raymond W. Pearson, Hampton, Va., general hospital 43; Capts. Page P. A. Chesesh and Leon M. Muedekin, Walter Reed general hospital, D. C.; 1st Lieut. Robert C. Craven, Fort Sheridan, Ill., general hospital 28.

1st Lieut. Fay T. Bowen to Fort Sill, Okla., Air Service Flying School, Port Field, for duty.

1st Lieut. Lerel M. Bowman to Fort Leavenworth, Kan., disciplinary barracks, for duty.

1st Lieut. Harvey H. Crosby to Fort Leavenworth, Kan., disciplinary barracks, for duty.

Week ending November 1st.

Capt. Leland S. Wilson to San Antonio, Tex., air service flying school, for duty.

Capt. James E. Cox to Columbus Barracks, Ohio, for duty.

1st Lieut. Leon A. Jones to Denver, Colo., general hospital 21, for duty.

1st Lieut. Jay R. Haskin to Fort Leavenworth, Kan., disciplinary barracks, for duty.

Navy Dental Corps.

Week ending October 25th.

Lieut. Patrick A. McCole, detached from receiving ship at Hampton Roads; to Naval Academy, Annapolis, Md.

Lieut. Joseph A. Reignier, detached from staff of commander of cruiser and transport force, Atlantic fleet; to navy yard, New York.

Week ending November 1st.

Lieut. Joseph F. Quinn (Jn.Gr.), Your 7298 received too late for compliance station, U. S. S. Des Moines.

Lieut. James M. Campbell detached from naval training station, Hampton Roads; to naval training station, Great Lakes, Ill.

Lieut. Francis S. Weir, detached from receiving ship at New York; to navy yard, Philadelphia, Pa.

Lieut. Joseph C. Munster, detached from navy yard, New York; to Paris Island.

Preparedness League of American Dentists.

ORGANIZED UNDER THE AUSPICES OF THE N. D. A.

The French-Belgian Dentists' Relief Fund.

(l'Aide Confraternelle Aux Dentistes Francais et Belges, Victimes de la Guerre.)

Drs. Villain, Davenport, and Burkhart, of Paris, have signified their willingness to act as a commission to represent the Preparedness League of American Dentists in distributing the funds raised for the benefit of our French and Belgian brother dentists. They will collaborate with the Aide Confraternelle, a society of French and Belgian dentists organized to render aid to those of our profession who suffered so severely from the ravages of war. Through these channels we are assured that our funds will be carefully and conscientiously administered.

Before this announcement appears in print, we will have forwarded the amount already raised and hope to have a report to publish

in the January journals. We earnestly urge all societies contemplating giving to this fund to arrange to do so as early as possible in order that aid may be given when most needed. While we are enjoying the era of our greatest prosperity as a profession, let us not be unmindful of our less fortunate brothers and accept this opportunity as a privilege whereby we may express our gratitude for the blessings we are now receiving.

Individual contributions are solicited also, and it would be a source of much satisfaction to the League to present to our French and Belgian brother dentists a long list of American contributors. In no other way could we do more to cement the bonds of lasting friendship than by showing ourselves to be real friends in need. As Cartoonist Briggs might say: "Ain't it a grand and glorious feeling" to give a boost "When a feller needs a friend?" This kind of real American fellow-feeling is legion and, as indi-

viduals, we should make our friends across the sea realize it to the fullest degree. We quote the following from a recent letter from Dr. Georges Villain:

Paris, le 15 Octobre, 1919.

My dear Confrère:

I have communicated to my colleagues of the Bureau of the Society of the School and the Dental Dispensary of Paris your letter of Septembre 15th. My colleagues are very happy to know the result already accomplished by the subscription of which you are so devoted an originator, and which you destined through l'Aide Confraternelle for the French and Belgian dentists, victims of the war. I wish also to send my grateful personal thanks to your League.

I accept the honor which you have conferred upon me in asking that I join with Dr. W. S. Davenport and Dr. Richard Burkhart as the committee representative of the Preparedness League of American Dentists, and the Fraternal League of French and Belgium Dentists, victims of the war.

Many thanks for the aid which you have given our confrères. I will endeavor to support you to the best of my ability on this side of the ocean.

Accept my sincere sentiments of friendship.

(Signed) GEORGES VILLAIN.

An Acknowledgment.

The following letter was recently received in reply to one from the president of the League in reference to a communication by Dr. Benoist which appeared in the *Dental Summary* of recent date. Although it is unfortunate to be misunderstood, yet in the final analysis it oftentimes results in establishing harmonious relations of a most satisfactory character:

E. BENOIST FILS,

Chirurgien Dentiste.

Pau, France, 1 Rue Serviez.

Dr. J. W. BEACH,

Buffalo, N. Y.

My dear Doctor,—I received this morning your letter of Septembre 22d.

I read with very great pleasure that the American Dentists wish to do the best they can for their French unhappy brothers; indeed, I always knew that American hearts were generous ones.

You will excuse me for having misunderstood the spirit of your efforts and you will accept my thanks for the great effort you

have done to help our French unhappy brothers, victims of the Huns.

Believe me sincerely and fraternally yours,

(Signed) BENOIST.

Make all checks payable to Dr. L. M. Waugh, 576 Fifth ave., New York, N. Y.

J. W. BEACH, *President*.

L'Aide Confraternelle Aux Dentistes Francais et Belges, Victimes de la Guerre.

TO THE EDITOR OF THE DENTAL COSMOS:

Sir,—In the DENTAL COSMOS for July 1919, p. 700, you published a new appeal from M. Beach, President of the Preparedness League of American Dentists in favor of "l'Aide Confraternelle." This appeal is followed by a letter from M. Quincerot, Secretary-General of that society.

This new appeal creates a regrettable confusion.

The work in which we are occupied and which was founded in 1915 is called "l'Aide Confraternelle Aux Dentistes Francais et Belges, Victimes de la Guerre." This had for its President, M. Viau, for Secretary-General, M. Barden, and for Treasurer, M. Fontanel. and an administrative council including among its members MM. Amoedo, I. Davenport, Frey, Godon, Martinier, Robinson, Roy, Sauvez, etc. It is for the assistance of this society that you have addressed many eloquent and ardent appeals; it is for this work that I have solicited your aid and that of M. Beach; it is for this work that you yourself have sent funds which have already been received.

It is unfortunate that M. Quincerot founded only recently a similar society having a name analogous to ours but shorter. That society, of whose existence I was ignorant until the article in the DENTAL COSMOS for July 1919 revealed it to me, has nothing in common with ours.

I wish therefore to ask you when in future you publish a new appeal or documents concerning our work, to use the precise title, "Aide Confraternelle Aux Dentistes Francais et Belges, Victimes de la Guerre," in order to avoid a confusion which would divide and lessen the generous efforts you are making and would mislead the philanthropic assistance that you desire and with which you wish to be associated.

Accept, my dear sir, my cordial sentiments and regard.

(Signed) GEORGES VILLAIN,
Secretary-General.

PARIS, FRANCE.

SPECIAL NOTICE.

Oral Hygiene Propaganda for the City of New York.

"A FREE DENTAL CLINIC IN EVERY PUBLIC SCHOOL."

The Oral Hygiene Committees of the First and Second District Dental Societies of the State of New York have inaugurated an Oral Hygiene propaganda in New York City, with the object of procuring legislation which will enable them to establish a free dental clinic for school children in each public school of the city of New York.

With this end in view, the joint committee has sent copies of the letters published below to each principal and each teacher in the public schools and also a copy of the last letter to each minister in greater New York. We take pleasure in publishing these letters and this information in order to acquaint Oral Hygiene committees in other communities with the plan which has been adopted in New York City.

New York, Sept. 12, 1919.

Mr. _____
Principal, P. S. No. _____

New York City.

Sir or Madam,—The Committee on Oral Hygiene of the First District Dental Society of the State of New York is, at the present time, making a supreme effort to have the municipal authorities equip and operate in every school in the city of New York, a free dental clinic.

Will you lend us your support to this end?

Will you address to each of your teachers a letter, as per form herein enclosed, requesting them to have each pupil in their class copy in their own hand writing the letter addressed to the Alderman, and have their parents sign it, returning to you the signed letter in a stamped and addressed envelope?

Will you finally see that these envelopes are properly mailed?

It is the opinion of this committee that such aid as the school principals only can

give this committee in this work is of immeasurable value, and that if faithfully and universally carried out will lead to the establishment of the much-needed dental clinic in every school.

If by chance, you yourself, or any of the teachers in your school, should happen not to be convinced of the great benefit which your school would derive from a free dental clinic, the perusal of the copies of original letters from principals of schools where free dental clinics have been in operation for several years, printed in the enclosed Bulletin, may be interesting and profitable reading to you. May this committee request you to carefully read them?

In conclusion may I ask you, in the name of the committee, to inform me what action, if any, you have taken as a result of this letter, and believe me,

Yours very truly,

Secretary, Oral Hygiene Committee.

New York, Sept. 12, 1919.

Sir or Madam,—Will you please write on the blackboard the following letter to be copied by every pupil in your class?

Hon. _____
Alderman, District No. _____
N. Y. C.

Dear Sir,—I have heard of the great benefits derived by children going to schools where free dental clinics are in operation and have heard that more such clinics are going to be established.

May I not appeal to you to use your influence for a free dental clinic in P. S. — which my children attend?

This letter should be signed by the parents, placed in an envelope, addressed, stamped by the pupils and returned to you.

Will you then turn over to me these let-

ters, so that I may see that they are properly mailed?

Yours very truly,

Secretary, Oral Hygiene Committee.

New York, Sept. 12. 1919.

Rev. _____

New York City.

Reverend Sir,—The Committee on Oral Hygiene of the First District Dental Society of the State of New York wishes to respectfully lay before you the crying need of safeguarding the general health of public school children through taking care of one of the most common avenues of disease into the body, the mouth of the child.

The deplorable condition of the teeth of the majority of school children is common knowledge to those who have paid even the most superficial attention to the matters of Oral Hygiene. The difficulty to cope with this situation through the ministrations of the private practitioner has again and again been proven, and the organized dental profession has long ago come to the conclusion that the most expedient and the most efficient way to take care of the teeth of the children of the community is by having free dental clinics in the public schools, installed and operated by the municipality. A number of free dental clinics, unfortunately much too small to reach the large need, but sufficiently to prove the great benefit derived from them, have been in operation for about seven years and the copies of original letters from principals of schools where such clinics now exist,

printed in the enclosed Bulletin, are vivid testimony as to what it would mean to all school children if each school would have a dental clinic.

This committee greatly appreciates the importance of an expression of opinion on your part in these matters, and that an appeal from you to the Alderman of your district, to the Commissioner of Health, and to his Honor the Mayor, will, in a great measure, aid the efforts that are being made at this time by this committee to have the municipal authorities equip and operate a free dental clinic in every school.

May I, in the name of this committee, respectfully request you for a letter expressing your views in the matter, and may I hope that you will kindly take the first opportunity to address your Alderman, the Commissioner of Health, Dr. Royal S. Copeland, and the Mayor, in behalf of the free dental clinic in the public schools?

May this committee further appeal to you with the request to interest in the matter, the members of your church, the various benevolent societies of your parish, requesting them to appeal to the city authorities for the free dental clinic in each school?

In the name of the Committee on Oral Hygiene of the First District, the legal branch for the section of the Dental Society of the State of New York, representing over 1500 dentists, I beg to extend to you my profound thanks in advance for whatever you may desire to do for this most deserving cause.

Respectfully,

Secretary, Oral Hygiene Committee.

SOCIETY NOTES AND ANNOUNCEMENTS

NOTICES should reach the Office of the DENTAL COSMOS *not later* than the 11th or 12th of the month preceding that of publication.

American Institute of Dental Teachers.

THE next annual meeting of the American Institute of Dental Teachers will be held at Detroit, Mich., January 27, 28, and 29, 1920. Hotel Statler will be the headquarters. A cordial invitation is extended to all persons interested in dental teaching.

RUSSELL W. BUNTING, *President*,
ABRAM HOFFMAN, *Sec'y*,
381 Linwood ave., Buffalo, N. Y.

American Society of Orthodontists.

THE next annual meeting of the American Society of Orthodontists will be held at the Edgewater Beach Hotel, Chicago, Ill., Monday, Tuesday, and Wednesday, April 5, 6, and 7, 1920. Those interested in orthodontia are invited to attend.

J. V. MERSHON, *President*,
Philadelphia, Pa.
F. M. CASTO, *Sec'y*,
Cleveland, Ohio.

Dental Protective Association of the U. S.

THE annual meeting of the Dental Protective Association of the United States will be held at the Palmer House, State and Monroe sts., Chicago, on the third Monday of December, the 15th, at 4 P.M. sharp. The report of the officers will be given, a board of directors will be elected, and such other business transactions as should come before the association. All members are urgently requested to be present.

By order of the Board of Directors,

J. G. REID, *President*,
J. P. BUCKLEY, *Vice-president*,
D. M. GALLIE, *Treasurer*.

Alpha Omega Dental Fraternity.

THE Alpha Omega Dental Fraternity will meet in convention on December 28, 29, and 30, 1919, at Washington, D. C. All fraters are requested to attend.

For further information address

JACQUES M. STRULLY, *Supreme Chancellor*,
Brooklyn, N. Y.
S. H. BOMENBLIT, *Supreme Scribe*,
Philadelphia, Pa.

Ohio State Dental Society.

THE fifty-fourth annual meeting of the Ohio State Dental Society will be held in Memorial Hall, Columbus, Ohio, December 2, 3, and 4, 1919. A varied program of papers and clinics on topics of present-day interest insures a meeting both interesting and instructive. Members of other state societies are cordially invited to meet with us.

F. R. CHAPMAN, *Sec'y*,
305 Schultz Bldg., Columbus, Ohio.

Bronx County (N. Y.) Dental Society.

THE Bronx County (N. Y.) Dental Society will hold a dental educational meeting with postgraduate clinic courses and manufacturers' exhibits, at the Hotel Commodore, December 2, 3, 4, and 5, 1919. Indorsed by First and Second District Dental Societies.

There will be essays by some of the most prominent men in the profession, who will tell us something that will be of help to the general practitioner.

Progressive postgraduate clinic courses will be given by the Detroit Dental Clinic Club. The reputation of this body of men for their fineness of technique and their ability to demonstrate and teach their methods is such that

no one should miss this opportunity. Courses will be limited as to number, and as to number who can take them.

The grand ballroom will be given over to the manufacturers' exhibit, which will be one of the largest ever held in this city.

BRONX COUNTY DENTAL SOCIETY.

Academy of Stomatology of Philadelphia.

THE Academy of Stomatology of Philadelphia will celebrate the twenty-fifth anniversary of its founding on Thursday evening, December 18, 1919, at 6.30 P.M., with a banquet in the Gold Room of the Hotel Adelphia. Ladies are cordially invited. Checks payable to Dr. Frederick W. Allen, 911 Flanders Bldg., Philadelphia, must be received by Dr. Allen before December 16, 1919. Three dollars, the cover.

Texas Board of Examiners.

THE Texas State Board of Dental Examiners will hold its next examination in Houston, Texas, at the Texas Dental College, beginning Monday, December 1, 1919, and continuing through December 4th. The examination fee is \$25, and must accompany all applications. The Texas dental law does not provide for the issuance of a temporary license nor reciprocity with any other state. Applications should be in the hands of the secretary at least five days before the examination.

For further information and application blanks address

HARRISON B. CAVE, *Sec'y*,
Wilson Bldg., Dallas, Tex.

California Board of Examiners.

THE next meeting of the Board of Dental Examiners of California for the purpose of examining applicants for a license to practice dentistry in this state will be held in the city of San Francisco, beginning on the 6th day of December, 1919, at 9.30 A.M. Each applicant shall file with the secretary of the board at least ten days before that date the following credentials: (1) Diploma or certificate of graduation from a reputable dental college approved by the board. (2) A diploma from an accredited high school or a certifi-

cate signed by the state superintendent of public instruction (or similar officer) to the effect that the applicant has had scholastic preparation equivalent in all respects to that demanded for graduation from a high school giving a four-year course of instruction. An applicant who has been a licensed practitioner of dentistry of some other state of the United States for a period of at least five years shall file such license or licenses, which will be accepted in lieu of high-school credentials. (3) Testimonial of good moral character. (4) A recent unmounted photograph of the applicant.

For further information address

C. A. HERRICK, *Sec'y*,
133 Geary st., San Francisco, Cal.

Montana Board of Examiners.

THE Montana State Board of Dental Examiners will hold their regular examinations at Helena, Mont., January 12, 1920. Applications should be in the hands of the secretary at least ten days before the examinations.

T. M. HAMPTON, *Sec'y*,
Helena, Mont.

Delaware Board of Examiners.

THE Delaware State Board of Dental Examiners will meet for the purpose of examining candidates for license to practice in Delaware, at Wilmington, Municipal Bldg., January 14 and 15, 1920, at 9 A.M.

For further information address

WARREN S. P. COMBS, *Sec'y*,
Middletown, Del.

North Carolina Board of Examiners.

THE next meeting of the North Carolina State Board of Dental Examiners will be held at Charlotte, N. C., beginning promptly at 9 o'clock on Thursday, January 15, 1920.

For further information and application blanks, address

F. L. HUNT, *Sec'y*,
Asheville, N. C.

Pennsylvania Board of Examiners.

THE next examination of the Pennsylvania Board of Dental Examiners will be held in Philadelphia and Pittsburgh, on Wednesday, Thursday, Friday, and Saturday, December

10, 11, 12, and 13, 1919. The theoretical examinations will be held in Musical Fund Hall, Philadelphia, and University of Pittsburgh, Pittsburgh. The examination in practical work will be held on Wednesday, December 10th, at 8.30 o'clock, at the Philadelphia Dental College, Philadelphia, and the University of Pittsburgh, Pittsburgh. Application papers may be secured from the Department of Public Instruction, Harrisburg.

For further information apply to

ALEXANDER H. REYNOLDS, *Sec'y*,
4630 Chester ave., Philadelphia, Pa.

South Dakota Board of Examiners.

THE next meeting of the South Dakota State Board of Dental Examiners will be held in Sioux Falls, S. D., January 7, 8, and 9, 1920, beginning promptly at 9 A.M. January 7th. All applications must be in the hands of the secretary by January 1st. Fee for examination, \$25; no reciprocity or interchange.

Full information and application blanks may be received by addressing

L. S. SPENCER, *Sec'y*,
Watertown, S. D.

UNITED STATES PATENTS

PERTAINING OR APPLICABLE TO DENTISTRY

ISSUED DURING OCTOBER 1919.

October 7.

- No. 1,317,832, to VERNON SPENCER. Artificial teeth.
- No. 1,317,886, to WILLIAM M. MUCHOW. Method of preparing amalgam for dentists' use.
- No. 1,317,980, to IRA LEE. Dental appliance.
- No. 1,318,246, to WEEDEN B. UNDERWOOD. Sterilizer.
- No. 1,318,254, to VIGGO V. J. ANDRESEN. Dental preparation and method of making the same.
- No. 53,903, to FRANK L. GRIER. Design for amalgam remover.
- No. 53,904, to FRANK L. GRIER. Design for alloy scoop.
- No. 53,955, to DANIEL A. ZURBRIGG. Design for dental plastic instrument.
- No. 53,956, to DANIEL A. ZURBRIGG. Design for dental carving instrument.
- No. 53,957, to DANIEL A. ZURBRIGG. Design for dental burnisher.
- No. 53,958, to DANIEL A. ZURBRIGG. Design for dental trimming-file.

October 14.

- No. 1,318,351, to IRA A. BURNETT. Moistening attachment for dental engine hand-pieces.
- No. 1,318,428, to FRANK E. J. YOUNG. Combined toothbrush holder and tumbler support.

- No. 1,318,522, to SOLOMON ALEXANDER. Toothbrush.
- No. 1,318,647, to GUY B. COLLIER. Rotary toothbrush.
- No. 1,318,964, to BENJAMIN CHESSE. Toothbrush.

October 21.

- No. 126,999, to ARTHUR W. BUCK. Trade-mark for packets of sensitized films for dental X-ray work.
- No. 127,165, to GEORGE WINCKLER. Trade-mark for tooth, nail, hair, mustache, artists', clothes, and bathing brushes.
- No. 127,167, to WORTHING & RAYMOND. Trade-mark for pliers, engraving tools, files and jewelers' saws.

October 28.

- No. 1,319,737, to FRANK M. WADSWORTH. Dental device and method of denture construction.
- No. 1,319,904, to EDWIN L. ROBERTS. Combined mouth-gag and tongue depressor.
- No. 1,320,133, to STEELE F. GILMORE. Anchorage for dental bridges and plates.
- No. 1,320,228, to WALTER G. E. HARVEY. Casting machine.
- No. 1,320,337, to SIMON MYERSON. Artificial tooth.

INDEX TO VOLUME LXI.

1919.

First pages of monthly issues:

PAGE	PAGE	PAGE	PAGE
JANUARY 1	APRIL 275	JULY 607	OCTOBER 929
FEBRUARY 97	MAY 361	AUGUST 711	NOVEMBER ..1059
MARCH 193	JUNE 449	SEPTEMBER ...819	DECEMBER ..1169

- ABSCCESS, acute apical, 41
 antral, treated with salicylic acid, 255
 chronic apical, 42
 Abscessed teeth, can be restored to usefulness, 677
 relation of sinusitis to, 752
 Abscesses, fractures complicated with, 257
 Absorption of premaxilla in tertiary syphilis of
 nose, 419
 Academy of Stomatology of Philadelphia, an-
 nouncement, 1277
 proceedings of, 234, 767
 Accidents, fatal, of the dental profession, 789
 Adrenalin, strength of, for anesthesia, 1038
 l'Aide Confraternelle, appeal from, 920
 the work of, 701
 Alabama Board of Examiners, 520
 Alcoholic injection, use of, in the treatment of
 tic douloureux, 503
 Alcoholization, local, treatment of essential facial
 neuralgia by, 249
 Allen, Frederick W., on G. V. Black's method of
 making and testing dental amalgam alloys,
 884
 Aller, Thomas G., *in memoriam*, 187
 obituary of, 92
 Alpha Omega Dental Fraternity, announcement,
 1276
 Alveolar abscess, 370
 Amalgam as a filling material, 54
 Amalgams, washing, 89
 Amalgam alloys, Black's method of making and
 testing, 735
 Amalgam fillings, finishing, 906
 American Academy of Periodontology, announce-
 ment, 816
 American dentistry, a plea on behalf of, 222
 American Institute of Dental Teachers, announce-
 ment, 95, 359, 1276
 American Medical Association, Section on Stom-
 atology, announcement, 518
 American Society of Exodontists, announcement,
 191, 925
 American Society of Orthodontists, announce-
 ment, 191, 1276
 Ames, V. H., on the dental radiograph, 1011
 Ameuille and Sordel, "Elimination of Potassium
 Iodid in the Urine and Saliva," review
 of, 1154
 Amycain, 505
 Anemia, chronic, arising from focal infection, 622
 Anesthesia, Local, in Dentistry (editorial), 329
 Anesthesia, anatomic landmarks, etc., in, 348
 conduction, a few precautions in, 346
 general, mouth preparation in cases of, 906
 in the reduction of fractures, 256
 Anesthesia, local, in children, 902
 nitrous oxid-oxygen, for difficult extractions,
 506
 novocain infiltration, in the everyday prac-
 tice of dentistry, 303
 novocain, making the injection, 305
 novocain, technique of, 304
 strength of epinephrin for, 1038
 the patient as a factor in, 185
 technique of administration of nitrous oxid
 and oxygen to children, 1039
 vomiting and nausea in, 907
 with apothesis, 256
 Anesthetics, certain local, report on the behavior
 of, 342
 in dentistry, 907
 local, pharmacology of, 1158
 local, their action on striated muscle, 785
 local, comparative values of, 501
 Angina, Vincent's, 504
 Ankylosis of the jaw, 903
 Ante-natal clinic, dental conditions at, 1156
 Anthony, L. Pierce, "Report of Committee on
 Dental Science and Literature," 633
 Anti-narcotic law, the Harrison, amendment of
 the, 437
 Antiseptic for wounds, iodid of starch an, 347
 Antiseptics, chlorinated group of, action on
 blood-clot, 235
 chlorinated group of, irritant properties of,
 250
 Antiseptics and germicides, efficiency of various,
 690
 Antral abscess treated with salicylic acid, 787
 Aphthous stomatitis, 787
 Apical dental tissues, histo-pathology of, 827
 Apicoectomy, failure in, 661
 Apical dental tissues, histo-pathology of, 827, 929
 Apothesis in anesthesia, 256
 Appeal to dentists for co-operation in the fight
 against venereal diseases, from the U. S.
 Public Health Service, 1133
 Arch, contour of the, 183
 dental, relation between form of, and the
 periphery of the cranium, 84
 removable lingual, as an appliance for the
 treatment of malocclusion of the teeth,
 247
 Arch form, 1265
 Arch outlines, analysis of Stanton's method of
 predetermining, 11
 analysis of Sved's method of predetermining,
 16
 Arizona Board of Examiners, 523
 Arkansas Board of Examiners, 447

- Army and Navy Dental News, 93, 187, 263, 352, 433, 510, 698, 808, 918, 1047, 1163, 1270
- Army cantonment, national, the dental clinic in the, 228
- Army dental patient, treatment of the, 292
- Army Medical Department, mouth hygiene campaign by, 1164
- Aronson, J., "To Prevent Corrosion of Metal Syringe Tripods" (Hints), 1258
- Arsenic, application of, in experiments to determine the causes of bone absorption around tooth roots, 365
- Arthritis, chronic, and focal infection, 622
the teeth and tonsils as causative factors in, 177
- Articulation, correcting, 1264
the problem of, 690
- Articulator, anatomical, the, 183
for crown and bridge work, 789
practical, essentials of a, 907
- Artificial dentures, gold as a base for, 256
- Artificial feeding, its bearing on general disturbances and malocclusion of teeth, 97
some of the disturbances due to, 101
vs. breast-feeding, 99
- Artificial teeth, standardizing the color of, by the classification of people into types and classes, 788
- Asepsis in filling root-canals, 908
- Ashton, John T., "The Treatment of the Army Dental Patient," 292
- Association of Military Dental Surgeons of the United States, announcement, 517, 926
- Astwood, C. Eric, "The Diet and Teeth of the Natives of Turks Islands, B. W. I." (correspondence), 230
- Atkinson, Wm W., "A Critical Consideration of Dr. G. V. Black's Method of Making and Testing Dental Amalgam Alloys," 735
- Atlanta-Southern Dental College, commencement of, 697
- Ausubel, Herman, "Dentistry and the Public," 218
"Painless Pulp Extirpation: Fractured Roots Remaining in the Jaw" (correspondence), 69
"Relation of Caries to Pyorrhea; Symmetrical Caries" (correspondence), 144
- Auricular prosthesis and plastic surgery, 480
- Automatic mallet, softening the blow of, 905
- BACCARANI, U., "Staphylococcemia Simulating Typhoid with Relapses," review of, 1260
- Backing for Steele facings, 787, 906
to fit to a tooth, 781
- Bacteria in the mouth, number of, 687
- Bacterial flora of mouth and nose of normal horses, 423
- Bacterial toxins, channels of absorption into the blood, 650
- Bacteriological control of dental procedures, 685
- Bacteriology, General, A Textbook of (bibliographical), 335
- Baker, C. G., "The Dental Clinic in the National Army Cantonment" (correspondence), 228
- Ballantyne, J. W., "Dental Conditions at an Ante-natal Clinic," review of, 1156
- Baltimore College of Dental Surgery, commencement of, 804
- Bampton, E. H., "Cases of Hereditary Dental Pigmentation," review of, 684
- Band and lingual arch technique, 247
- Bankhart, A. S. B., "Congenital Malformation of the Left Temporo-maxillary Joint and Both Hip Joints," review of, 84
- Barnes, H. Freeman, "Light and Lighting for Dentists," 845
- Barnhard, Wm. H., on relation between the mouth and systemic diseases, 1136
- Baudouin, Marcel, "Anatomical Demonstration of the Triple Origin of Human Incisors," review of, 85
"Mandibular Fracture, Curing Spontaneously, from the Polished Stone Epoch," review of, 903
- Baylor University, Dental Department, commencement of, 697
- Beach, Geo. B., "President's Address" (Dental Society of the State of New York), 875
- Beach, J. Wright, on modern tendencies in bridge work, 1236
- Beck, H. M., "Novocain Infiltration Anesthesia in the Everyday Practice of Dentistry," 303
on the connection between oral sepsis and systemic disease, 160
- Bell's facial palsy, 344
- Bellefleur, Joseph L., obituary of, 351
- Benzoic acid a valuable antiseptic and devitalizer of bacteria, 898, 1224
- Benzyl alcohol, antiseptic action of, 339
- Biddle, J. F., on the dental nurse, 1231
- Bilancioni, Guglielmo, "Tuberculosis of Maxillary Sinus," review of, 502
- Black, Arthur D., "Roentgenographic Studies of Tissues Involved in Chronic Mouth Infections," review of, 251
- Black, Norman, "Erythrophlein Hydrochlorid as an Agent for Devitalizing the Dental Pulp," 296
- Black's method of alloying, 738
- Bleecher, Geo. J., "Benzoic Acid a Valuable Antiseptic and Devitalizer of Bacteria" (Hints), 898, 1224
- Blechlly, Geo. P., "Case of Pyorrhea Alveolaris Treated by Emetin," review of, 87
- Bliss, Vance W., "in memoriam" resolutions, 508
- Blood agar, use of, for the study of streptococci, 681
- Blood-clot, action of chlorinated antiseptics on, 255
- Bloodgood, J. C., "Treatment of Tumors of the Upper Jaw with Cautey," review of, 341
- Blum, Theodor, "Failures and Accidents with Mandibular Injections," 275
- Boggs, Russel H., "Treatment of Malignancy in the Mouth and Throat by Radium," review of, 252
- Bohn, W. H., "Report of the Committee on Oral Hygiene and Public Dental Education" (Pennsylvania State Dental Society), 1102
- Bonar, E. A., "A Trouble in the Casting of Gold Inlays" (correspondence), 232
- Bone absorption around the roots of teeth, 361
by wedging teeth, 363
from irritation due to materials passing through the roots, 366
normal, 362
- Bone formation, 783
- Bone-grafting in fractures of the mandible, 345
- Bone repair in fracture of the jaws, 91
- Bone spatulas, 89
- Books received, 335, 674, 1031
- Booth, W. W., on the dental assistant, 1102
- Bourguet, Julian, "Technique of Gassereotomy," review of, 904
- Boyer, E. H., "Bacterial Flora of Mouth and Nose of the Normal Horse, review of, 423
- Braxton, H. H., "Impacted Fourth Molar," review of, 681
- Brewer, A. C., on gold foil as a filling material, 1012
- Bridgeport Demonstration, The (editorial), 670

- Bridgeport, Conn., report of five years of mouth hygiene in the public schools of, 607
- Bridge, gold three-tooth molar, removed from the right bronchus; case report, 945
- removable, description of a satisfactory, 211
- the Nesbitt removable; modified technique, 1159
- Bridge work, 57
- advantages of removable over fixed, 91
- fixed, 1173
- fixed or removable, 346
- modern tendencies in, 1169
- removable, 1181
- root-canals and, 348
- removable, scientific aspect of, 689
- removable, with cast clasps, advantages claimed for, 506
- Bridges, new, for old, 211
- small inlay, setting of, 1037
- Briggs, Carl S., obituary of, 352
- Broach, dental, in the bronchus; report of a case of, 201
- dental, swallowed, 1038
- Broaches, canal, securing, 906
- nerve, broken, 905
- Brocq, A. J. L., "Lichen Planus of the Mucosa and Leucoplakia," review of, 905
- Bronchus, dental, broach in the, 413, 661
- Bronchoscopy, gold three-tooth molar bridge removed from the right bronchus by means of, 945
- removal of a dental broach from the bronchus by means of, 201
- Bronx Co. (N. Y.) Dental Society, announcement, 1166
- Brown, Arthur W., obituary of, 691
- Brown, G. V. I., "The Surgery of Oral Diseases and Malformations, Their Diagnosis and Treatment" (bibliographical), 74
- Brown, J. H., "The Use of Blood Agar for the Study of Streptococci," review of, 681
- Brown, J. L., "Mare Island Dental Facilities," 510
- Brushing the teeth, directions for, 90
- Burch, R. W., "Why Facings Break, and a Method of Prevention" (Hints), 499
- Burgess, Jas. Kendall, "The Application of Surgery as One of the Four Basic Principles of Oral Restoration" (III), 59
- on modern tendencies in bridge work, 1238
- Burke, David F., "New Bridges for Old," 211
- "Report of a Case of Acute Leukemia," 725
- Burkhart, H. J., on oral hygiene work among the school children of Rochester, N. Y., 1131
- Burning out the wax from a casting investment, 688
- Burs, fissure, economy in the use of, 177
- Business system in connection with office practice, 1078
- Byrnes, R. R., "Business System in Connection with Office Practice," 1078
- on gold foil as a filling material, 1013
- CADIOT, "Labial and Lingual Cancer in Animals," review of, 502
- Calcification and fixation of the teeth, food deficiencies as a factor in, 786
- California Board of Examiners, 445, 1167
- California State Dental Association, announcement, 358
- Callahan, John R., Memorial (special notice), 355
- Callahan's method, 347
- Campaign to Enlist the Co-operation of the Dental Profession in the Fight Against Venereal Diseases, by the Bureau of the Public Health Service, Washington, 1132
- Canal broaches, securing, 906
- Cancer, artificial teeth as a cause of, 345
- labial and lingual, in animals, 502
- of the mouth, 505
- of the oral cavity, jaws, and throat, treated by electro-thermic methods or in combination with surgery, the roentgen ray, and radium, 252
- of the pericementum, case of, 428
- of the tongue, 343
- Canine, a double-rooted, 412
- Capillary attraction in the treatment of root-canals, 119
- Capping pulps, 507
- Carbolic acid, experiments to determine the part played by in bone absorption around tooth roots, 367
- Caries, electrobolytic theory of, 21
- relation of, to pyorrhea, 144, 320
- reduction of, under régime of oral hygiene practiced in the public schools of Bridgeport, Conn., 611
- symmetrical, 144
- Carr case, the, final decision in, 1268
- Case, A. E., "Post-operative Pain Control," 985
- Case, Calvin S., "The Foundation Principles in the Mechanism of Speech and the Importance of Training the Speech of Cleft-Palate Patients after Operations," 1, 97
- Case, Irene, "Correlation Between Mental Defects and Anomalies of the Hard Palate," review of, 904
- Cast, plaster, to duplicate, 686
- Casting gold inlays, a trouble in, 70, 145, 232
- in cold molds, 686
- karat of gold used in, 688
- Casts, plaster of Paris, hard, 426
- Cautery, treatment of tumors of the upper jaw with, 341
- Cavities in porcelain teeth, to drill, 505
- Cavity preparation for cast inlays, 1265
- Cavity walls, adaptation of gold foil to, 687
- Cementing Steele facings, 687
- Cements, 55
- Chambers, W. T., "A Case of Exostosis" (Hints), 780
- Chamois skin, to clean, 506
- Chaplin, Wm. R., obituary of, 508
- Chase, R. L., "Report of a Case of Impacted Third Molar Extracted Under Infiltration Anesthesia," 1223
- Chayes, H. E. S., on modern tendencies in bridge work, 1241
- Chester and Delaware Counties Dental Society, address at banquet celebrating the one hundred and first anniversary of Dr. Jesse Cope Green, 321
- Chevrier, L., "Lingual Decortication for Leucoplakia under Local Anesthesia," review of, 420
- Chicago College of Dental Surgery, commencement of, 801
- Children, local anesthesia in, 902
- Children's teeth, care of, 257
- to prevent decay of, by attention to diet, 90
- "Chinese silver, why not?" a reply to (correspondence), 319
- Chipman, Ernest D., "Etiology of Lichen Planus," review of, 179
- Chloramin-T (chlorazene), technique of applying, 1221
- use of, in dentistry, 375
- Chloramins in the treatment of pyorrhea, 1218
- Chloramins and hypochlorites, use of, in dentistry, 85
- Chlorin as an antiseptic, 960

- Chlorin group of antiseptics, relative irritant properties of, 250
 action of, on blood-clot, 255
 Churchill's tincture of iodine, 257
 Cincinnati College of Dental Surgery, commencement of, 694
 Clark, Wm. L., "Cancer of the Oral Cavity, Jaws, and Throat. Treatment by Electro-thermic Methods, or in Combination with Surgery, the Roentgen Ray, and Radium, with an Analysis of 200 Cases so Treated," review of, 252
 Cleaning teeth, 1158
 Cleft-palate patients, importance of training the speech of, after operations, 1, 134
 Clement, Geo. B., "Report on Dental Science and Literature," 52
 Clinic, rural dental, 346
 Clinics, dental, for school children, 1032
 Cobey, H. P., on gold foil as a filling material, 1012
 Cohen, Th. E. De Jonge, "A Contribution to the Morphology of the 'Dens in Dente,'" 224
 Cole, P. P., "Fistula of Parotid in War Wounds of the Face and Jaws, with a Note on Radium Treatment by Robert Knox," review of, 782
 Cole, P. P., and C. H. Bubb, "Bone-grafting in Fracture of the Mandible," review of, 345
 Coley, Dr., "Melanotic Sarcoma or Melanoma of Superior Maxilla," review of, 786
 College of Dental and Oral Surgery of New York, commencement of, 917
 College of Physicians and Surgeons, San Francisco, commencement of, 796
 Collins, Clifford U., "Parotitis as a Post-operative Complication," review of, 425
 Collins, Michael J., obituary of, 790
 Collodion, an ideal impression filler and varnisher, 493
 Colyer, Claude G., "Acute Ulcerative Gingivitis," review of, 180
 Columbia University, Dental Department, commencement of, 800
 Complement fixation tests as applied to dental practice, 1034
 "Condensed Chemical Dictionary, The" (bibliographical), 1152
 Conduction anesthesia, advantages of nerve blocking by, 1265
 a few precautions in, 346
 anatomical landmarks, etc., in, 348
 technique for the administration of, 711
 Conductivity and osmosis, discussion of experiments in, 22
 Conductivity of temperature, use of, in diagnosis of pulp diseases, 311
 Conference of Public School Dentists, announcement, 926
 Conklin, Wirt H., "Removing Steele's Facings from Old Bridges" (Hints), 677
 Connecticut Dental Commission, 445, 1057
 Connecticut Dental Hygienists' Association, announcement, 358
 Connecticut State Dental Association, announcement, 272
 Contact point, position of the, 256, 1039
 Contouring synthetic fillings, 676
 Convulsions, reflex, during dentition, 87
 Cooke, A. R., on what constitutes reinfection of root-canals, and how can it be prevented? 998
 Coolidge, E. D., "Bacteriological Control of Dental Procedures," review of, 685
 Cope, V. Zachary, "Acute Necrotic Parotitis," review of, 1260
 Cornell, E. R., "Dental Caries in Pregnancy" (correspondence), 660
 Cornfeld, Samuel, "Removing Mercury Stains from Gold Crowns" (Hints), 678
 Cotton, Henry A., "The Role of Focal Infections in the Psychoses," review of, 423
 Crane, Arthur B., "A Practicable Root-canal Technique," 1193
 Cranium, relation between periphery of the, and the form of the dental arch, 84
 Creasote, application of, in experiments to determine the cause of bone absorption around tooth roots, 368
 Creighton University, Dental Department, commencement of, 797
 Crown and bridge work, articulator for, 789
 bibliography of, 635
 diagnosis in, 60
 jacket, preparation of teeth for, 1266
 operative procedure in, 62
 prognosis in, 61
 prophylaxis in, 63
 the gold shell, 1171
 Crowns, gold cap, used for secreting despatches, 505
 Crowns and bridges, setting, 347
 Cullen, Glenn E., and Herbert D. Taylor, "Relative Irritant Properties of the Chlorin Group of Antiseptics," review of, 250
 Cunningham, Geo., obituary of, 430
 Cup, impression, technique of, 906
 Cyanosis in nitrous oxid anesthesia, 426
 Cyst, dentigerous, in connection with third mandibular molar, 788
 Cysts, dermoid, lying within the floor of the mouth, 685
 DAKIN's solution in the treatment of pyorrhea, 377, 489
 use of, in treatment of chronic alveolar abscess, 378
 use of, in treatment of fractures and wounds of the jaws, 378
 use of, in treatment of root-canals, 376
 Dalhousie University, Dental Department, commencement of, 795
 Dame, C. S., and A. Natale, "Movement of Eyelid, Associated with Mastication," review of, 501
 Darby, Edwin T., address on "The Advantages of Living a Century" (at dinner given to celebrate Dr. J. C. Green's one hundred and first birthday), 324
 Davis, C. E., "Vincent's Angina in U. S. Hospital No. 18, Waynesville, N. C.," review of, 680
 Davis, W. B., and W. H. Spencer, "A Study of Blood-Pressure Changes During Nitrous Oxid-Oxygen Anesthesia," review of, 1155
 Davis crown technique, 1222
 Dead teeth, 340
 Dean, Frank, on dental radiography, 764
 Deaver, John B., "Post-operative Parotitis," review of, 424
 Decay of children's teeth, to prevent, by attention to diet, 90
 Deciduous teeth, care of, 257
 Dehydration in root-canal filling, 963
 Delaware Board of Examiners, 96, 523, 1277
 Delta Sigma Delta Fraternity, announcement, 816
 Demarest, Samuel A., on report of Committee on Practice (Dental Society of the State of New York), 991
 Denney, R. E., on considering the wax pattern, 238

- Denney, R. E., on the dental assistant, 1105, 1231
on the relation of dental affections to systemic diseases, 662
- "Dens in dente," a contribution to the morphogeny of, 224
- Dental Alumni Society of the University of Pennsylvania, announcement, 443
- Dental assistant, importance of, and a method of training her, 1085
- Dental corps, report of Surgeon-general on the present status of, 263
- Dental examination a requirement of employment, 1158
- Dental Hygiene Council of Massachusetts, 817
- Dental Movement, The, in Great Britain (editorial), 494
- Dental profession, honesty and harmony in the, 213
the, and the war, 866
- Dental Protective Association of the United States, announcement, 1166
- Dental Review*, The Passing of the (editorial), 176
- Dental Science and Literature, report on (to Mississippi Dental Association), 52
report on (to Pennsylvania State Dental Society), 633
report on, for the year 1918 (to Maryland State Dental Association), 976
- Dental Society of Chester and Delaware Counties, annual dinner celebrating the one hundred and first anniversary of Dr. Jesse Cope Green, 321
- Dental Society of the State of New York, announcement, 192
proceedings of, 875, 987, 1116, 1236
report of Committee on Practice, 947
- Dental Surgeons of the American Expeditionary Force, notice to, 517
- Dental treatment, 1158
- Dentist, a new species of; do we want it? 1205
or stomatologist? 68
the, and the recent influenza epidemic, 299
- Dentistry and the nation, 1021
and the public, 218
in 1919 (see editorial), 71
- Dentistry for the Masses (editorial), 893
- Dentistry, Specialization in (editorial), 775
- Dentition, reflex convulsions during, 87
- Denture, lower, relation of teeth to the ridge in, 1038
- Denture-making, re-review of (see editorial), 172
- Dentures, aluminum, method of firm attachment of vulcanite to, 1037
upper and lower, removal of redundant gum tissue prior to insertion of, 899
vulcanite, repairing, 183
- Dermatoses, certain, relation of focal infection to, 179
- Dermoid cysts, the process of resorption occurring in teeth in, 342
- Devitalized teeth, danger of, exaggerated, 1190
- Dewey, K. W., and F. B. Noyes, "Lymphatics of the Dental Region," review of, 82
- Dewey School of Orthodontia, Alumni Society, announcement, 95
- Diagnosis, 60
of dental conditions—clinical, roentgen, and microscopic, 742
of diseases of the dental pulp, special procedure in, 309
importance of taking history of case into consideration before making, 742
- Diastemia in its relation to the pathogenesis of dental caries and to variations in cuspal topography, 1156
- Diaz, Louis N., "Report of a Case of Emphysema" (Hints), 781
- Dichloramin-T, points in the use of, 347, 375
solution of, preparation of, 961
- Dick, J. L., "Abnormal Conditions of Enamel in Cases of Malnutrition," review of, 181
- Dictionary, The Condensed Chemical (bibliographical), 1152
- Diet and teeth of the natives of Turks Islands, Br. W. I., 230
- Diet, influences of, on the second dentition, 1260
influence of, on tooth formation, 246
- Discussion on "A Critical Consideration of Dr. G. V. Black's Method of Making and Testing Dental Amalgam Alloys," 883
on "A New Species of Dentist: Do We Want It?" 1225
on "A Question in Inter-Professional Ethics," 1110
on "Artificial Feeding and Its Bearing on General Disturbances and Malocclusion of the Teeth," 163
on "Business System in Connection with Office Practice," 1249
on "Clinical, Roentgen, and Microscopic Diagnosis of Dental Conditions," 767
on "Considering the Wax Pattern," 234
on "Modern Tendencies in Bridge Work," 1236
on "Relation of Dental Affections to Systemic Disturbances," 662
on "Report of Committee on Practice (Dental Society of the State of New York), 987
on "The Interpretation of Radiographs as a Basis for Oral Surgical Procedures," 763
on "The Practical Use of the Dental Radiograph," 1009
on "The Relative Value of Gold Foil as a Filling Material," 1012
on "The Value of the Dental Assistant and a Method of Training Her," 1102
on "The War and the Profession," 879
on "The Use of Orthodontic Appliances in the Treatment of Fractures of the Mandible and Maxilla from War Casualties," 166
on "To What Degree are Oral Pathological Conditions Responsible for Systemic Diseases?" 159
on "Ulceromembranous Gingivitis, the Gingival Phase of Vincent's Disease," 1007
on "What Constitutes Reinfection of Root-canals, and How Can It be Prevented?" 996
- District of Columbia Board of Examiners, 520
- District of Columbia Dental Society, announcement, 271
- Diveley, Rex L., and Wm. W. Duke, "Multiple Infection: A Study of Relationship Between Infections," 1059
- Dorrance, G. W., on the relation of dental affections to systemic diseases, 665
- Dowsley, John F., obituary of, 909
- Drilling cavities in porcelain teeth, 505
- Dunbracco, W. W., on gold foil as a filling material, 1012
- Dunbreuil-Chambardel, L., "A Peculiar Affection of the Premaxillary Incisors," review of, 422
- Duke, Wm. W., "Multiple Infections: A Study of the Relation of One Infection to Another," review of, 182
and Rex L. Diveley, "Multiple Infection: A Study of Relationship Between Infections," 1059
- Dutton, W. F., "Gingival Septico-pyemia," review of, 180
- Dynamometer, the G. V. Black, 737

- EASTERN Association of Graduates of the Angle School of Orthodontia, announcement, 441
proceedings of, 163
- Eby, L. W., "Formation of Bone," review of, 783
- Eckerman, Ragnar, "A New Departure in the Construction of Obturators," review of, 88
- Edentulous mouths, surgery in connection with, 788
- Edgelow, Percy, "Treatment of Acute Septic Gingivitis," review of, 180
- Education, dental, 1266
- Education, Dental, of the Public (editorial), 1026
- Eggleston, Cary, and R. A. Hatcher, "Preliminary Report on the Behavior of Certain Local Anesthetics," review of, 342
- Egypt, oral surgery in, during the Old Empire, 900
- Electric current, testing the teeth by means of, 1195
- Electrical examination, an aid in determining pulp vitality, 312
- Electro-diagnosis, dental, 122
- instrumentarium in, 123
- modus operandi* of, 123
- Elphinstone, J. H., "Novocain-Adrenalin Stock Solution" (Hints), 675
- Emerson, Captain, on ulcero-membranous gingivitis, 1008
- Emetin, case of pyorrhea treated by, 87
- Emphysema, a peculiar case of, 348
- report of a case, 781
- Enamel, abnormal conditions of, in cases of malnutrition, 181
- contribution to the study of, 423
- mottled, a study of, 685
- Endameba buccalis, is it the real cause of pyorrhea? 981
- Endocarditis, recurrent, and focal infection, 624
- Engelbach, Wm., and J. T. Tierney, "Case of Hypopituitarism," review of, 83
- Epinephrin, strength of, for anesthesia, 1038
- Engineering principles, application of, for the predetermination of arch outlines, 11
- Epithelial debris located in the peridental membrane and other structures, 929
- Epithelioma, basal-cell, diagnosis and treatment of, 252
- Epstein, Sigmund, "Focal Infection as a Cause of Painful Heel," review of, 1259
- Epulides, multiple, case of, 1157
- Erythrophlein hydrochlorid as an agent for devitalizing the dental pulp, 296
- certain features of its action, 298
- indications for and technique of its use, 296
- Eschauzier, Francis, "Trench Mouth and Its Treatment" (correspondence), 233
- Esophagus, tooth plate impacted in the, 500
- Essig, Norman S., on considering the wax pattern, 238
- Ethics, inter-professional, a question of, 1088
- Evans, Dr., on business system in connection with office practice, 1251
- Exodontia, 52
- Exostosis, a case of, 780
- Explorers, tempering, 89
- Extraction, indications for the use of nitrous oxid in, 91
- of impacted third molar, 506
- vs.* treatment, 724
- Extractions, difficult, nitrous oxid-oxygen anesthesia for, 506
- Exudative diathesis, the, 103
- Eye color and the abnormal palate in neuroses and psychoses, 1259
- Eye diseases, dental infection and, 181
- Eyelid, movement of, associated with mastication, 501
- FABRIS, U., "Diastemia in Its Relation to the Pathogenesis of Dental Caries and to Variations in Cuspal Topography," review of, 1156
- Face, trophic lesions of the, 420
- Face-bow, the, 1038
- Facing, broken, to repair, 255
- Facings, why they break, and a method of prevention, 499
- "False teeth" as a cause of cancer, 345
- Faradic current, action of, on the pulp, 313
- technique of applying, 314
- Farnum, L. M., "A Trouble in Casting Gold Inlays" (correspondence), 145
- Farr, R. E., "Local Anesthesia in Children," review of, 902
- Faught, L. Ashley, "The Present Status of Teeth Without Vital Pulp," 626
- address on "Reminiscences of Dr. Jesse Cope Green as a State Examiner," 325
- on clinical, roentgen, and microscopic diagnosis of dental conditions, 767
- Faulkner, E. R., "Tic Douloureux, with Special Reference to Treatment by Alcoholic Injection," review of, 503
- Federspiel, M. N., "Dermoid Cysts Lying Within the Floor of the Mouth," review of, 685
- Feldman, M. Hillel, "A Consideration of Some Lesions of the Oral Cavity from the Viewpoint of their Relationship to Systemic Infection," 711
- "An Instance of Fourth Molar" (correspondence), 1096
- "Failure in Apicoectomy" (correspondence), 661
- "Procain Anesthesia" (correspondence), 68
- Ferris, H. C., on the use of orthodontic appliances for the treatment of fractured jaws due to war casualties, 166
- Field, C. E., "False Teeth as a Cause of Cancer" (correspondence), 345
- Filling root-canals, asepsis in, 908
- Filling material, gold foil as a, 971
- Fillings, amalgam, finishing, 906
- gold foil, 184
- synthetic cement, to protect from saliva, 89
- Films, dental, to mount, 1264
- Filter, a quick, 1158
- Fistula, chronic, from a buried deciduous tooth, 1157
- of the parotid in war wounds of the face and jaws, 782
- Fitsburgh, J. C. G., on the dental nurse, 1232
- Fixed or removable bridge work, 346
- Fletcher, Horace, death of, 688
- Focal infection, 57
- as a cause of painful heel, 1259
- radical treatment of, from a military point of view, 193
- vertigo and, 905
- what constitutes a, 1184
- Focal infections, diagnosis of, 949
- rôle of, in the psychoses, 423
- Fenes, Alfred C., "Report of Five Years of Mouth Hygiene in the Public Schools of Bridgeport, Conn.," 607
- Food deficiencies as a factor in tooth calcification, 786
- Fordham, W. H., on the dental nurse, 1229
- Foreign bodies in air and food passages, 337
- "Forsyth Day at Forsyth Dental Infirmary," 686
- Forsyth Dental Hygienists' Alumni Association, election of officers, 192
- Forsyth Dental Infirmary for Children, announcement, 442
- Forsyth Training School for Dental Hygienists, announcement, 445

- Forsyth Training School for Dental Hygienists, proceedings of, 1253
- Fountain cuspidors, employment of, in public places, advantages of, 317
- Fourth molar, an instance of, 1096
- impacted, 681
- Fowler, Wm. C., on the work of the clinic for treatment of venereal diseases in the District of Columbia, 1146
- Fracture, mandibular, curing spontaneously from the Polished Stone epoch, 903
- mandibular, due to tooth extraction, pyemia as a sequel to, 250
- of lower maxilla, technique of wiring corresponding teeth of superior and inferior maxillæ in the treatment of, 1038
- of the jaws, bone repair in, 91
- of the mandible, bone-grafting in, 345
- of the mandible, personal experiences with Lane's plate in, 1036
- Fractured roots, remaining in the jaw, 69
- Fractures, anesthesia in reduction of, 256
- complicated with abscesses, 257
- of the jaws, mutilated, treatment of, 455
- of the mandible and maxilla from war casualties, use of orthodontic appliances in the treatment of, 128
- Frazier, Chas. H., "An Operable Tumor Involving the Gasserian Ganglion," review of, 86
- Free dental clinics, municipal appropriations for, 1265
- French, A. B., "Enlarged Thyroid Due to Impacted Third Molar," review of, 1263
- French, J. Gay, "Perithelioma of Right Maxillary Antrum: Radium Treatment, review of, 1263
- French-Belgian Relief work, a report of, 701
- French-Belgian Dentists' Relief Fund, 920
- Friesell, H. E., on the dental assistant, 1107, 1231
- Furfey, J. Austin, "The Relative Value of Gold Foil as a Filling Material," 971
- on business system in connection with office practice, 1251
- Fundenberg, W. H., on a question of inter-professional ethics, 1113
- GAIRDAN, DERAN G., *in memoriam* resolutions, 262
- Gans, L. R., "Pseudo-Hemophilia," 648
- Gardner, B. S., "Retracting and Suturing of Soft Tissues with Regard to Extraction of the Lower Third Molar," 1092
- Garretson, John L., "A New System of Dental Radiography," 862
- Gasserian ganglion, an operable tumor involving the, 86
- injection of, in treatment of neuralgia of the fifth nerve, 254
- Gasserectomy, technique of, 904
- Georgetown University, Dental Department, commencement of, 1045
- George Washington University, Department of Dentistry, announcement, 444
- commencement of, 805
- Gerber, Isaac, on the interpretation of dental radiographs, 763
- "German" silver, what it is, 255
- Germicides and antiseptics, efficiency of various, 690
- Gibbs, B. F., "Economy in the Use of Fissure Burs" (Hints), 177
- Gibbin, Thomas J., obituary of, 432
- Gingival irritation, treatment of, 194
- Gingival-septic pyemia, 180
- Gingival shrinkage in gold inlays, 259
- Gingivitis, acute septic, treatment of, 180
- acute ulcerative, 180
- superficial, treatment of, 427
- Gingivitis, suppurative, with alveolar involvement, a new surgical procedure, 84
- Girdwood, John, "Tube Teeth and Porcelain Rods" (bibliographical), 673
- Glands, ductless, relation of thyroid hormone to, 182
- sublingual and submaxillary salivary, development of, in human embryos, 1261
- Glycethymoline, application of, in experiments to determine the causes of bone absorption around the roots of teeth, 369
- Gnathodynamometer, Black's, 738
- Goble, L. S., on report of Committee on Practice (Dental Society of the State of New York), 989
- Gold as a base for artificial dentures, 256
- karat of, to be used in casting, 688
- Gold fillings, 54
- Gold foil, adaptation of, to cavity walls, 687
- as a filling material, 971
- use of the matrix in contouring anterior teeth with, 81
- Gold foil fillings, 184
- Gold inlay, the indirect method, 1159
- Gold inlays, 89, 629
- Gold saddles, simple technique for making, 90
- Gordon, H. Laing, "Eye Color and the Abnormal Palate in Neuroses and Psychoses," review of, 1259
- Gradenigo's syndrome or triad, 87
- Graham, H. A., "Dental Broach in the Bronchus" (correspondence), 413
- Graham, L. W., "Litmus as an Indicator of the Salivary Reaction," 409
- Granulomata and cysts, 43
- Great Britain, The Dental Movement in (editorial), 494
- report presented to Parliament on present conditions of dentistry and the workings of the Dentists Act (1878), 525
- Green, Jesse Cope—addresses at banquet in honor of, 321
- remarks by, at banquet given in his honor by the Dental Society of Chester and Delaware Counties, 327
- Grieve, G. W., on the use of orthodontic appliances in the treatment of fractured jaws due to war casualties, 168
- Grieves, Clarence J., "Ultero-membranous Gingivitis, the Gingival Phase of Vincent's Angina," 819
- on the dental radiograph, 1010
- Guilford, Dudley, on considering the wax pattern, 274
- Guilford, Simeon H., obituary of, 260
- Gum blocks, checking of, 412, 660
- Gum tissue, redundant, removal of, prior to insertion of full upper and lower dentures, 899
- Guthrie, Edward W., *in memoriam*, 187
- Gutta-percha paste for coating root-canals, 964
- HALL, J. T., "The Technique of Pyorrhea Treatment with Medicated Pastes," review of, 82
- Hall, Rupert E., "Impression Filler, Surfacers, and Separator," 493
- Hamilton, H. C., "Comparative Values of Some Local Anesthetics," review of, 501
- Hamer, A. A. H., "A Relation Between the Periphery of the Cranium and the Form of the Dental Arch," review of, 84
- Hammond, Roland, "The Teeth and Tonsils as Causative Factors in Arthritis," review of, 177
- Harden, A., S. S. Zilva, and G. F. Still, "Infantile Scurvy," review of, 341

- Hardy, Geo. E., on business system in connection with office practice, 1249
on ulcero-membranous gingivitis, 1008
- Hare-lip and cleft palate, operative treatment of, 338
- Harris, Leon, "The Dentist and the Recent Influenza Epidemic," 299
- Harrison anti-narcotic law, amendment of the, 437
- Harrison, J. H., "A Trouble in the Casting of Gold Inlays" (correspondence), 232
- Harvard Dental School, commencement of, 806
- Haslett, Harry S., obituary of, 790
- Hatton, E. H., "Microscopic Studies of Diseased Peridental Tissues," review of, 83
- Hatfield, Hugh K., "A Preliminary Study of the Effect of Rickets on the Jaws," review of, 1032
- Hawley, C. A., "A Removable Retainer," 449
- Hayem, Georges, "Sialophagia of Central Origin," review of, 83
- Hayes, T. H., on the dental nurse, 1230
- Heckard, Major W. A., on the work of the Preparedness League of American Dentists, 1145
- Hellman, Milo, "Artificial Feeding and Its Bearing on General Disturbances and Malocclusion of the Teeth," 97
- Hemorrhage, retinal, bacterial toxin as a cause of, 254
- Henneberger, L. P., "Dakin's Solution in the Treatment of Pyorrhea," 489
- Herder, S., "Honesty and Harmony in the Dental Profession," 213
- Hertig, O. L., "A Question of Inter-Professional Ethics," 1088
- Hertz, J. C., on the dental nurse, 1231
- Higgins, J. C., "in memoriam" resolutions, 262
- Hip joints and left temporo-maxillary joint, congenital malformation of, 84
- Histology of the Mouth, Normal and Pathological (bibliographical), 75
- Hocker, Mrs. Lon O., on public dental education, 1021
- Hoffman, G. M., "Pyorrhea and Autogenous Vaccines," 1094
- Hofheimer, J. A., "Pyemia as a Sequel to Mandibular Fracture Due to Tooth Extraction," review of, 250
- Honesty and harmony in the dental profession, 213
- Hooton, E. A., "Note on a Deformed Skull from Siwash Oasis," review of, 901
"Oral Surgery in Egypt During the Old Empire," review of, 900
- Hopewell-Smith, A., "The Normal and Pathological Histology of the Mouth" (bibliographical), 75
- Horel, Ruth F., "The Use of Hypochlorites and Chloramins in Dentistry," 373
review of, 85
- Howard University Dental College, commencement of, 696
- Howe, Percy R., "Capillary Attraction in the Treatment of Root-canals," 119
"To What Degree are Oral Pathological Conditions Responsible for Systemic Disease?" 33
- Huet, Emile, "Radicular Odontome from the Upper Quaternary," review of, 903
- Hughes, Walter R., "Extraction vs. Treatment," 724
- Hunter, O. B., on the relation of the dentist toward the control of venereal diseases, 1140
- Hunter's charges against the dental profession, 860
- Hunter's views on oral sepsis, 620
- Hursthous, J. F., "Soldering Without Pits" (Hints), 676
- Hyatt, T. P., on report of Committee on Practice (Dental Society of the State of New York), 994
on the relation of the dental condition to child development, 1116
- Hygiene, mouth, report of five years of, in the public schools of Bridgeport, Conn., 607
oral, directions for brushing the teeth, 90
- Hygienist, dental, 908
dental, legislation on, 688
- Hygienist, dental, Maine law providing for, as amended, 509
- Hygienist, The Dental, Preventive Dentistry and (editorial), 241
- Hypochlorites and chloramins, use of, in dentistry, 85, 373
- Hypopituitarism, case of, 83
- IDAHO Board of Examiners, 96
- Illinois Board of Examiners, 446, 1116
- Illinois dental law, legal opinion on section of, relating to registration of licenses, 1042
- Illinois Department of Registration and Education, 1057
- Illinois State Dental Society, announcement, 95
- Impacted fourth molar, 681
- Impacted lower third molar, extraction of, retracting and suturing of soft tissues with regard to, 1092
- Impacted third molar, extracted under infiltration anesthesia, 1223
extraction of, 506
unusual case of, 111
- Impression, matrix for boxing the, 787
- Impression cup technique, 906
- Impression filler, surfacers, and separator, 493
- Impression-taking, plaster, 428
- Incisors, human, anatomical demonstration of the triple origin of, 85
maxillary, a peculiar affection of the, 422
- Indiana Dental College, commencement of, 1046
- Infantile scurvy, 341
- Infection, chronic; a study of relationship between infections, 1059
chronic, and the symptomatology of syphilis, 1062
dental, and eye diseases, 181
fatal, contracted by dentists at the operating chair, 789
focal, and chronic urticaria, 1155
focal, as a cause of painful heel, 1259
focal, relationship of, to certain dermatoses, 179
lowered resistance to, 1060
metastatic, 714
mouth, as a source of systemic disease, 179
oral foci of, from a dentist's standpoint, 1183
the teeth as a cause of foci of, 968
- Infections, chronic mouth, roentgenographic studies of tissues involved in, 251
chronic, relationship between, 1061
dental, in children, 1155
focal, and systemic disease, 184
multiple; a study of the relation of one infection to another, 182
oral, and systemic conditions, 258
oral, treatment of, 194
tonsil, 906
- Infectious areas, the radiograph and, 184
- Infectious diseases, effect of one upon the other, 1060
- Infiltration anesthesia, impacted third molar extracted under, 1223

- Inflammation, 185
 Influenza, expelled secretions of mouth and respiratory tract responsible for spread of, 613
 Influenza epidemic, the dentist and the, 299
 parotitis as a complication of, 420, 424, 425
 unusual cases of, three signs of some value in the diagnosis of, 420
 Influenza bacillus, occurrence of, in throats and saliva, 421
 Inlay, gold; indirect method, 1159
 an m.o.d., method of making, 1037
 Inlay restoration of incisal corners, 499
 Inlays, cavity preparation for, 1265
 gingival shrinkage in, 259
 gold, 89, 629
 restoring lost margins in, 687
 some advantages of the indirect method of making, 184
 International Society of Prosthetists, 926
 Intra-oral skin grafting; establishment of the buccal sulcus, 784
 Iodin, an easy method of applying, 80
 Churchill's tincture of, 257
 Iowa Board of Examiners, 192, 445, 928
 Iowa State Dental Society, announcement, 272
 Iritis, case of, due to third molar impaction, 789
 Itinerant dental instructors, 783
- JACKET crown, preparation of the tooth for, 1266
 Jackson, Chevalier, "Foreign Bodies in Air and Food Passages," review of, 337
 Jackson, Chevalier, and Wm. H. Spencer, "Dental Broach in the Bronchus: Report of a Case," 201
 "Gold Three-tooth Molar Bridge Removed from the Right Bronchus: Case Report," 945
 Jackson, V. H., on modern tendencies in bridge work, 1243
 James, W. W., "Case of Multiple Epulides," review of, 1157
 Japan, a notable concession to dentistry in, 659
 Jaquette, W. A., on the relation of dental affections to systemic diseases, 665
 Jaw, ankylosis of, 903
 Jaw deformities, perverted "functional" activities in the production of, 1153
 Jaw fractures, ununited, treatment of, 391, 455
 necessity of immobilization of jaws in, 392
 Jaw-winking phenomena and its explanation, 1035
 Jaws and apical dental tissues, histo-pathology of, 929, 1067, 1213
 Jenkins, Newell Sill, obituary of, 1160, 1267
 Jones, C. R., on a question of inter-professional ethics, 1112
 Jordan, E. O., "A Textbook of General Bacteriology" (bibliographical), 335
Journal of the Allied Dental Societies ceases Publication (editorial), 246
- KANSAS Board of Examiners, 435
 Kansas City Dental College, commencement of, 1045
 Kaplan, Abraham, "Contouring Synthetic Fillings" (Hints), 676
 Kaufer, H. J., on the war and the dental profession, 882
 Kelsey, H. E., on business system in connection with office practice, 1250
 on the dental radiograph, 1009
 on the use of orthodontic appliances in the treatment of fractured jaws during war casualties, 168
- Kentucky State Dental Association, announcement, 272
 Kiefer, H. A., "Vincent's Angina," review of, 504
 Kingery, L. B., "Secondary Syphilitic Periosteitis of Mandible: Report of Case," review of, 1157
 Kubota, S., and D. I. Macht, "Concerning the Action of Local Anesthetics on Striated Muscles," review of, 785
- LANE's plate in jaw fractures, personal experience with, 1036
 Lankford, Arthur, "The Principles Involved in Interchangeable Interdental Splints with Attachments for Extra-facial Tension in Maxillo-facial Surgery," 839
 La Prade and Loiret, "Normal and Pathologic Cytology of the Submaxillary and Parotid Salivas," review of, 1156
 Large teeth and small jaws, 258
 Laval University, School of Dental Surgery, commencement of, 697
 Law, new dental, of Minnesota, 791
 Law, Wm. G., on the use of orthodontic appliances in the treatment of fractured jaws due to war casualties, 166
 Leak, E. G., "An Odd Simulation of Lingual Paralysis" (correspondence), 145
 Leak, Wm. H., "Report of the Oral Hygiene Inspector, University of the State of New York, to the Dental Society of the State of New York," 870
 on oral hygiene in public instruction throughout the State of New York, 1128
 Lee, A. P., on the dental nurse, 1230
 Lee, E. G., "An Odd Simulation of Lingual Paralysis" (correspondence), 145
 "Inlay Restoration of Incisal Corners" (Hints), 499
 Legislation, dental, amendment to the dental law of Tennessee, 692
 dental—final decision in the Carr Case, 1268
 dental, for the elimination of malpractice in dentistry, 859
 dental—the hygienist, in Michigan, 688
 Leidy, Joseph, "Myristica (Nutmeg) in the Treatment of Pyorrhea Associated with the Parasitic Endameba," 295
 Leigh, R. W., "Dental Broach in the Bronchus" (correspondence), 661
 Leiner, J. H., "Study of the Etiological Factors Bearing on Therapeutics of Bell's Facial Palsy," review of, 344
 Lemierre, A., "Bilateral Syphilitic Parotitis with Facial Paralysis of the Left Side," review of, 1262
 Leptothrix asteroidis, 501
 Leucoplakia, buccal, syphilis as a factor in, 1033
 lichen planus of the mucosa and, 905
 lingual, decortication for, under local anesthesia, 420
 Leukemia, acute, report of a case of, 725
 Levine, Abraham, "The X-ray as a Positive Diagnostic Aid" (Hints), 336
 Levy, Joseph, "Root Amputation," 649
 Levy, S. J., "A Double-rooted Canine" (correspondence), 412
 Lewis, D. N., "Pain Following Local Anesthesia," 407
 Liberty Loan (The Victory) (editorial), 333, 418
 Licenses, registration of, legal opinion on section of Illinois dental law relating to, 1042
 Lichen planus, etiology of, 179
 of the mucosa and leucoplakia, 905
 Lichty, J. A., on a question of inter-professional ethics, 1110

- Light and lighting for dentists, 845
 Lipoma, lingual, a case of, 86
 Litmus as an indicator of the salivary reaction, 409
 Local Anesthesia in Dentistry (editorial), 329
 Local anesthetics, action of, on striated muscle, 785
 comparative values of, 501
 pain following the use of, 407
 pharmacology of, 1158
 Lowenstein, G. A., and Wm. J. Gies, "Does Normal Saliva Contain Uric Acid (Urate)?" 425
 Loyola University, School of Dentistry, commencement of, 1044
 Lutz, A., "Jaw-winking Phenomenon and Its Explanation," review of, 1035
 Lydston, G. Frank, "The Passing of the Mucous Patch and Its Congeners," 301
 Lymphatics of the dental region, 82
 McALPIN, V. H., "A Teaser for Gold Soldering" (Hints), 336
 McCauley, D. H., and B. L. Worthley, "Treatment of Ununited Fractures of the Jaws: *Résumé* of Work Done by Dental Department of the U. S. Army, General Hosp. No. 11, Cape May, N. J.," 391, 455
 McCormack, Samuel B., "Address of Welcome" (Pennsylvania State Dental Society), 1097
 McFadden, T. W., on a question of inter-professional ethics, 1114
 on the dental nurse, 1236
 McGill University, Department of Dentistry, commencement of, 696
 McKay, F. S., "Mottled Enamel: A Further Consideration of an Endemic District in Virginia, together with Data Relative to the Brava People, Cape Verde Islands," review of, 685
 McKenzie, Dan, "Absorption of Premaxilla in Tertiary Syphilis of Nose," review of, 419
 McManus, James, tribute to, on his birthday (poem), 892
 McParland, P. V., on the dental nurse, 1226
 Machat, Bertram B., "Dental Electro-Diagnosis," 122
 "Pulp Testing" (correspondence), 143
 on modern tendencies in bridge work, 1245
 Macht, David I., "Parotitis as a Complication of Influenza," review of, 420
 Macht, I. D., and D. E. Nelson, "On the Antiseptic Action of Benzyl Alcohol," review of, 339
 MacKay, Hugh, "Focal Infection and Chronic Urticaria," review of, 1155
 MacKenzie, Chas. M., "Mental Myopia vs. Public Sanitation," 317
 Macmillan, Arthur S., "Dentist or Stomatologist?" (correspondence), 68
 "Suggestions to Beginners in the Use of Novocain Conduction Anesthesia" (Hints), 678
 Maine Board of Examiners, 360
 Maine Dental Law Providing for Dental Hygienists, as amended, 509
 Malformation, congenital, of the left temporomaxillary joint and both hip joints, 84
 Malformations, multiple oral, 86
 Malignant disease, treatment of, 342
 Malignant tumors of the jaws, 249
 Mallet, automatic, softening the blow of, 905
 Malnutrition, abnormal conditions of enamel in cases of, 181
 Malocclusion, effect of artificial feeding upon, 97
 frequency of, in the mouths of school children, 612
 the removable lingual arch as an appliance for the treatment of, 247
 Malpractice in dentistry, dental legislation for the elimination of, 859
 Mammalian Dentition, Introduction to, by T. W. Todd (bibliographical), 78
 Mandible, regeneration of the, 689
 Mandibular fracture, curing spontaneously, from the Polish Stone epoch, 903
 Mandibular injections, failures and accidents with, 275
 importance of a thorough knowledge of anatomy to insure success in, 276
 percentage of failures in, 278
 report of accident cases in, 280
 technique of, 277
 Mandibular meniscus, displaced, treatment of, 337
 Manges, Willis S., on clinical, roentgen, and microscopic diagnosis of dental conditions, 767
 Manning, Paul R., "Electrobiolytic Theory of Dental Caries," 21
 Marchand, L., and L. Testut, "Trigeminal Paralysis," review of, 421
 Mare Island navy yard, dental facilities at, 510
 Margins, restoring lost, in inlays, 687
 Marquette University, School of Dentistry, commencement of, 796
 dental alumni association of, announcement, 1056
 Marthaler, Ed., "The Process of Resorption Occurring in Teeth in Dermoid Cysts," review of, 342
 Marshall, John S., "A Contribution to the Study of Human Enamel, with Special Reference to Its Nutrition," review of, 423
 Martin, H. H., "Ocular Syndrome of Dental Origin," review of, 1036
 "Treatment of Neuralgia of the Fifth Nerve by Injection of the Gasserian Ganglion," review of, 254
 Maryland Board of Examiners, 446, 1057
 Maryland State Dental Association, proceedings of, 1006, 1249
 "President's Address," 1006
 Massachusetts Board of Examiners, 192, 520, 928
 Masses, Dentistry for the (editorial), 893
 Mastication, movement of eyelid associated with, 501
 Matrices for use in pattern-making for inlay work, 206
 Matrix, the, as an aid in contouring anterior teeth with gold foil, 81
 for boxing the impression, 787
 for porcelain inlays, 427
 Matteson, A. E., obituary of, 1162
 Matthews, C. V., on business system in connection with office practice, 1250
 Mayer, L., "Osteogenesis," review of, 784
 Mead, Sterling V., "The Practical Use of the Dental Radiograph," 965
 Medical College of Virginia, School of Dentistry, commencement of, 915
 Medicated pastes, treatment of pyorrhea with, 82
 Medicine and dentistry, socialization of, 220
 Meharry Dental College, commencement of, 1044
 Mellanby, May, "The Influence of Diet on Tooth Formation," review of, 246
 Mendel, Joseph, "Experimental Studies on Pyorrhea Alveolaris," review of, 504
 "Leptothrix Asteroids," review of, 501

- Mental defects and anomalies of the hard palate, correlation between, 904
- Mercury stains, removing from gold crowns, 678
- Merritt, Arthur H., "Oral Prophylaxis in Its Relation to Preventive Dentistry," 473
on the relation between artificial feeding and malocclusion, 163
"Ultero-membranous Gingivitis" (correspondence), 1095
- Mershon, J. V., "Band and Lingual Arch Technique: The Removable Lingual Arch as an Appliance for the Treatment of Malocclusion of the Teeth," review of, 247
- Metric System, the, 1264
- "Metric Weights and Measures," third edition, 687
- Meyer, John H., obituary of, 186
- Michigan Board of Examiners, 521
- Micrometer, the G. V. Black, 735
- Midgley, A. L., "The Importance of the Dental Assistant, and a Method of Training Her," 1085
- Milk, essential elements of, 100
tolerance and intolerance of, 100
- Miller, F. D., on the dental nurse, 1228
- Miner, L. M. S., "The Interpretation of Radiographs as a Basis for Oral Surgical Procedure," 759
- Minnesota State Dental Association, announcement, 95
new dental law of, 791
- Mississippi Board of Examiners, 192
- Mississippi Dental Association, announcement, 357
- Missouri Board of Examiners, 446, 1056
- Missouri State Dental Association, announcement, 95
proceedings of, 1015
- Mitchell, Leonard G., on relation between bad oral conditions and venereal diseases, 1144
- Mitchell, Wm. H., "Dental Broach in the Bronchus" (correspondence), 413
- Molar, third mandibular, dentigerous cyst in connection with, 788
- Moldine, swaging with, 905
- Molds, cold, casting in, 686
- Montana Board of Examiners, 96, 1277
- Moodie, R. L., "Studies in Paleopathology," review of, 251
- Morestin H., "(1) Lingual Lipoma—Case, and (2) Multiple Oral Malformations," review of, 86
- Morse, Carlton B., "A Case from Practice" (correspondence), 986
- Mothers, dental treatment for, 689
- Mottled enamel, a study of, 685
- Mouth, cancer of the, 505
number of bacteria in the, 687
preparation of, in cases of general anesthesia, 906
septic foci in, treatment of, 339
- Mouth examination, 745
charts for recording, 748
instrumental and microscopic, 747
- Mouth Hygiene Campaign by the Army Medical Department, 1164
- Mouth lamps, illuminated, 849
- Mouth and teeth, personal care of, 476
professional care of, 475
- Mouthwashes, 478
- Mucous patch and its congeners, the passing of the, 301
- Muetze, Chr., "A Reply to 'Why Not Chinese Silver'" (correspondence), 319
- Municipal appropriations for free dental clinics, 1263
- Murray, B. A., "Mouth Infections as a Source of Systemic Disease," review of, 179
- Murray, G. D., "Spasm of Accommodation with Disturbance of Ocular Movements, of Dental Origin," review of, 1154
- Murray, Robert, on report of Committee on Practice (Dental Society of the State of New York), 987
- Myers, V. C., and A. G. Dellenbaugh, "Studies on the Amyolytic Activity of Human Saliva, with a New Method," review of, 344
- Myocarditis and focal infection, 624
- NAHAKARA, ITCHIGORA, "A Notable Concession to Dentistry in Japan" (correspondence), 659
- Nahas, Albert, "A Plea on Behalf of American Dentistry," 222
"Immediate Plate Repair" (Hints), 1258
- Natale, A., and C. S. Danel, "Movement of Eyelid Associated with Mastication," review of, 501
- National Association of Dental Faculties, 926
- National Association of Dental Librarians, 1055
- National defense act, proposed amendment to, relative to the army dental corps, 187
- National Capital Dental Society of the District of Columbia, convocation of dentists by the Bureau of Public Health Service, proceedings of, 1136
- National Dental Association, announcements, 270, 441, 704, 812, 922, 1050
- Neal, Max, obituary of, 1041
- Nebraska Board of Dental Secretaries, 520, 1166
- Nephritis, chronic, and focal infection, 623
- Nerve blocking by conduction anesthesia, 1265
- Nerve broaches, broken, 905
- Nesbitt removable bridge, modified technique, 1159
- Neuralgia, facial, treatment of, by local alcoholization, 249
of the fifth nerve, treatment of, by injection of the Gasserian ganglion, 254
trifacial, operative treatment of, 1263
under fixation abscesses, cure of, 1259
- Neuroses and psychoses, eye color and abnormal palate in, 1258
- Nevada Board of Examiners, 96
- New England Dental Society, announcement, 708
- New, G. B., "Ankylosis of Jaw," review of, 903
- New Jersey Board of Registration, 192, 927
- New Jersey State Dental Society, announcement, 444
- New York City, oral hygiene propaganda for, 1274
- New York College of Dentistry, commencement of, 802
- New York State Examinations in Dentistry, postponement of, 448, 817
- Nickel ("German") silver, composition of, 255
- Nicoll, J. H., "Operative Treatment of Hare-lip and Cleft Palate," review of, 338
- Nitrous oxid, indications for use of, in extracting, 91
- Nitrous oxid-oxygen anesthesia for difficult extractions, 506
study of blood-pressure changes during, 1155
- Nitrous oxid anesthesia, cyanosis in, 426
- Nitrous oxid and oxygen, technique of administration to children, 1039
- Nodine, Alonzo M., "The Diagnosis and Treatment of Oral Infections," 726
"The Radical Treatment of Focal Infections from a Military Point of View," 193
- Nomenclature, dental, 57
- Non-vital teeth, treatment of, 428
- North Carolina Board of Examiners, 95, 359, 1168

- North Carolina State Dental Society, announcement, 359
- North Dakota Board of Examiners, 96, 709
- Northeastern Dental Association, proceedings of, 754
- Northern Illinois Dental Society, announcement, 709
- Northern Indiana Dental Society, announcement, 810
- North Pacific College, School of Dentistry, commencement of, 807
- Northwestern University Dental School, announcement, 359
- commencement of, 805
- Northern Ohio Dental Association, announcement, 272, 519
- Novitsky, Josef, "Dead Teeth," review of, 340
- Novocain-adrenalin stock solution, 675
- Novocain, suprarenin in combination with, 687
- Novocain conduction anesthesia, suggestions to beginners in the use of, 678
- Novocain infiltration anesthesia in the everyday practice of dentistry, 303
- Noyes, F. B., and K. W. Dewey, "Lymphatics of the Dental Region," review of, 82
- Nurse, dental, comparison of, to the medical nurse, 1209
- Nutmeg in the treatment of pyorrhea associated with the parasitic *endameba*, 295
- OBTURATORS, a new departure in the construction of, 88
- Occlusal surfaces, importance of properly reproducing, 905
- Ochsner, A. J., "Clinical Observations Concerning Malignant Tumors of the Jaws," review of, 249
- Ocular movements, disturbance of, of dental origin, spasm of accommodation with, 1154
- Ocular syndrome of dental origin, 1036
- Odontome, radicular, from the Upper Quarterly, 903
- Office, dental, lighting the, 845
- overhead units in illuminating the, 845
- spot-lamps for, 848
- Office practice, business system in connection with, 1078
- Ogur, Chas., "Safe Way of Using a Separating Disk" (Hints), 81
- Ohio College of Dental Surgery, commencement of, 916
- Ohio State Dental Society, announcement, 1166
- Oil of cassia, application of, in experiments to determine the causes of bone absorption around tooth roots, 369
- Oil of cloves, use of, in experiments to determine the causes of bone absorption around tooth roots, 369
- Oil of cloves and zinc oxid, 90, 259
- Oldstein, H. J., "Dental Legislation for the Elimination of Malpractice in Dentistry," 859
- Ontario Dental Society, announcement, 357
- Oral hygiene, as a national public health question, recognition of, by the British Government (see editorial) 414
- bibliography of, 636
- importance of, during epidemics, 421
- report on, to the Dental Society of the State of New York, 870
- true, ignored by many dental practitioners, C. N. Johnson in, 474
- Oral hygiene propaganda for the City of New York, 1274
- its influence on the dental profession, 949
- Oral hygienist, the, 950
- Oral infection, grave systemic disturbance caused by, 216
- Oral infections, diagnosis and treatment of, 726
- effects of, classified, 731
- influence of, on the system, 730
- Oral lesions in connection with somatic diseases, special diagnosis and prognosis of, 750
- Oral lesions and systemic infection, 711, 730
- Oral pathological conditions; to what degree are they responsible for systemic disease? 33
- Oral prophylaxis as a preventive measure, 478
- Oral restoration, application of surgery as one of the four basic principles of, 59
- Oral surgery, 948
- bibliography of, 633
- in Egypt during the Old Empire, 900
- Oral surgical cases in practice, 942
- Organisms, selectivity of, 908
- Orthodontia—a removable retainer, 449
- bibliography of, 636
- radiography and, 1037
- Orthodontic appliances, use of, in the treatment of fractured jaws due to war casualties, 128
- Orthodontic appliances and gingival tissue, 683
- Osmotic pressure and electrical conductivity in the mouth, alleviation of the effects of, 27
- Osseous demineralization and its treatment, 503
- Osteogenesis, 784
- Ottolengui, R., on the shell crown and fixed bridge work, 1172
- on what constitutes reinfection of root-canals and how can it be prevented? 996
- PAIN as an aid in the diagnosis of pulp diseases, 309
- following local anesthesia, 407
- post-operative, control of, 985
- Paiste, Jas. L., "What Dr. Jesse Cope Green Has Been to Our Society" (address at banquet), 326
- Palate, hard, anomalies of, and mental defects, correlation between, 904
- Paleopathology, studies in, 251
- Palmer, Bissell B., on the war and the dental profession, 880
- Palmer, E. Carleton, on "considering the wax pattern," 237
- Palsy, Bell's facial, 344
- Paralysis, lingual, an odd simulation of, 145
- of the sixth cranial nerve associated with otitis media (Gradenigo's syndrome or triad), review of, 87
- trigeminal, 421
- Parker, Harold J., "Root Resection: A Plea for a Broader Field," 388
- "Parlors," charlatan, a visit to, 859
- Parotitis, acute necrotic, 1260
- bilateral syphilitic, with facial paralysis of the left side, 1262
- post-operative, 424, 425
- Parsons, Luther M., "President's Address" (Maryland State Dental Association), 1006
- Patents, dental, monthly record of, 96, 274, 360, 448, 524, 710, 818, 928, 1058, 1168, 1278
- Patient, the, as a factor in anesthesia, 185
- consideration for the, after removing the rubber dam, 255
- Pattern-making for inlays, 204
- Pattern wax, state of working plasticity of, 205
- Patterson, L. L., "The Use of the Matrix as an Aid in Contouring Anterior Teeth with Gold Foil" (Hints), 81
- Pellagra, the saliva in, 785

- Pennsylvania Association of Dental Surgeons, proceedings of, 662, 883
- Pennsylvania Board of Examiners, 447, 1167
- Pennsylvania State Dental Society, announcement, 358
- proceedings of, 146, 1097, 1225
- Percussion to determine pulp conditions, 314, 1196
- Periapical disease, classification of, 1198
- Periapical infections, bibliography of, 634
- Pericementum, a case of cancer of the, 428
- Peridental membrane, development of, 1213
- Peridental tissues, diseased microscopic studies of, 83
- Periodontia, a biologic aspect of, 853
- diagnosis of, 854
- prognosis and indications for treatment of, 857
- Periosteitis, secondary syphilitic, of mandible, 1157
- Perithelioma of right maxillary antrum: radium treatment, 1263
- Peters, Chas. E., on a question of inter-professional ethics, 1114
- on the dental assistant, 1105
- Pfahler, G. E., "Treatment of Malignant Disease by Combined Methods," review of, 342
- Phenol-sulfonic acid a most effective styptic, 89
- Philadelphia Dental College (Temple University), Alumni Society, announcement, 95
- commencement of, 806
- meeting of class of 1914, 191
- Philippine Dental College, commencement of, 1044
- Phillips, Geoffrey, "Dentistry and the Nation," review of, 1031
- Phonology, principles of, C. S. Case on, 8
- Pickerell, H. P., "Intra-oral Skin Grafting: The Establishment of the Buccal Sulcus," review of, 784
- Pierce, C. C., on campaign of the U. S. Public Health Service for control of venereal diseases, 1137
- Pigmentation, hereditary dental, cases of, 684
- Pilot, L., and D. J. Davis, "Hemolytic Streptococci in the Faucal Tonsils, and Their Significance as Secondary Invaders," review of, 421
- Plaster casts, hard, 426
- to duplicate, 686
- Plaster impression-taking, technique of, 428
- Plastic surgery and auricular prosthesis, 480
- Plate polishing, 1264
- Plate repair, immediate, 1258
- Plates, tooth, gold as a base for, 256
- impacted in the esophagus, 500
- Plate work, position of the contact point, 256
- re-revival of (see editorial), 172
- resilient teeth, 348
- to prevent inaccuracy while setting up teeth, 183
- Pneumococci, atypical type II, a study of, 421
- Polishing vulcanite work, 686
- Pont, Dr., "Plastic Surgery and Auricular Prosthesis," 480
- Porcelain inlays, matrix for, 427
- Porter, Ross, on a question of inter-professional ethics, 1113
- Post-operative pain control, 985
- Post-protection in difficult cases, 1264
- Post-war prosthesis, oral surgery, fractures, splints, anesthesia, and physical diagnosis, special course in, 190
- Potassium iodid, elimination of, in the urine and saliva, 1154
- Potter, Geo. B., "Mankind's Greatest Benefactor," 28
- Potter, N. B., S. Bradbury, and A. McNeill, "Streptococcus Oral Sepsis," review of, 1034
- Potter, Wm. H., on the importance of oral hygiene as a prophylactic measure in the army, 1253
- Power, D'Arcy, "Cancer of the Tongue," review of, 343
- Practice of dentistry and dental surgery, by persons not qualified under the Dentists Act, 1878, evils connected with, 525
- Pregnancy, care of mouth and teeth during, 660, 689, 874
- dental deficiency during, 1160
- Prentiss, Arthur V., obituary of, 909
- Preparedness League of American Dentists—notes and news, 189, 267, 435, 700, 920, 1272
- special post-war course under the auspices of the, 94, 189
- Preventive Dentistry and the Dental Hygienist (editorial), 241
- Preventive dentistry, oral prophylaxis in its relation to, 473
- relation of the dental hygienist to, 1207
- the hope of the future, 219
- Prime, Jas. M., on the dental assistant, 1106, 1227
- Primrose, Geo. L., obituary of, 910
- Pringle, J. H., "Displacement of the Mandibular Meniscus and Its Treatment," review of, 337
- Prinz, Hermann, "Diseases of the Dental Pulp"—(I) "Diagnosis," 308
- (II) "Etiology," 382
- (III) "Classification," 385
- (IV) "Treatment," 641, 718
- "What Constitutes Reinfection of Root-canals, and How Can It Be Prevented?" 954
- on clinical roentgen, and microscopical diagnosis of dental conditions, 767
- Pritchett, Ida W., and Ernest G. Stillman, "Occurrence of Bacillus Influenzæ in Throats and Saliva," review of, 421
- Procain anesthesia, 67
- Prognosis, a special use of the term in oral restorations, 61
- Prophylactic treatments, frequency of, 478
- Prophylaxis, 950
- Prosthesis, Dental, The Re-revival of (editorial), 172
- Prosthetic dentistry, 635
- Pseudo-hemophilia, 648
- Psi Omega Fraternity, New York alumni, announcement, 271
- Ohio Alumni Chapter, announcement, 517
- Psychoses, rôle of focal infection in the, 423
- Public dental education (see editorial), 1026
- Public Health, Venereal Disease and the (editorial), 1149
- Public school dentists, conference of, 816
- Pulp, capping a, 507
- degeneration of, 723
- diseases of, 308, 641, 718
- exposed healthy, indications for capping, 642
- exposed healthy, treatment of, 641
- hyperemia of, 643
- protection of the, 346
- removal of, 506
- Pulp-capping materials, 642
- Pulp diseases, classification of, 385
- Pulp disturbances of a parasitic nature, 384
- result of shock from electrical disturbances, 384
- result of some chemical irritant, 384
- result of some mechanical agent, 382
- Pulp extirpation, painless, 69
- painless, fractured roots remaining in the jaws, 231

- Pulp inflammation, destructive or productive, 386
 Pulp testing, 143
 Pulpitis, acute simple, 646
 acute purulent, 718
 chronic hyperplastic, 721
 chronic ulcerative, 720
 secondary, 385
 Pulpless deciduous teeth, 346
 Pulp, diseased, 505
 vital, the present status of teeth without, 626
 Putrescent teeth, treatment of, 427, 757
 Pyemia as a sequel to mandibular fracture due to tooth extraction, 250
 Pyorrhea alveolaris, 55, 89
 associated with the parasitic endameeba, its treatment with myristica (nutmeg), 295
 bibliography of, 636
 case of, treated with emetin, 87
 chloramins in the treatment of, 1218
 Dakin's solution in the treatment of, 489
 experimental studies on, 504
 is the endameeba buccalis the real cause of? 981
 relation of caries to, 144, 320
 treatment of, 1220
 treatment of, with medicated pastes, 82
 Pyorrhea and autogenous vaccines, 1094
 Pyorrhea and Vincent's gingival disease, importance of differentiating between, 823
- QUINN, JAMES E., obituary of, 1267
- RADICALISM, 1190
 Radiograph, case report showing the value of, as a preventive factor in dental practice, 486
 interpretation of, 257, 967
 limitations of, in diagnosing dental lesions, 183
 practical use of, 965
 uncertainty of the, 1191
 Radiograph, the, and infectious areas, 184
 Radiographs, essential in dental work, 907
 interpretation of, as a basis for oral surgical procedure, 759
 practical use of, 965
 Radiography, dental, a new system of, 862
 dental, position of films in the mouth, 966
 dental, use of films and plates in, 966
 stereoscopic, 967
 Radiography and orthodontia, 1037
 Radio-translucent areas not necessarily infectious areas, 1188
 Radium, cancer of the oral cavity, jaws, and throat treated by, 252
 malignancy in the mouth and throat treated by, 252
 Railliet, G. "Syphilis as a Factor in Buccal Leucoplakia," review of, 1033
 Ravitch, M. L., and S. A. Steinberg, "Relationship of Focal Infection to Certain Dermatoses," review of, 179
 Ray, Wm. A., obituary of, 350
 Reactions in infectious diseases, allergic, 1062
 non-specific, 1065
 Redden, Jos. E., "Trench Mouth and Its Treatment," 66
 Rehm, Arthur A., obituary of, 186
 Reilly, Thomas F., "Three Signs of Some Value in the Diagnosis of Unusual Cases of Influenza," review of, 420
 Relief Fund (French-Belgian Dentists'), 920
 Removable bridge work, advantages of, over fixed, 91
 scientific aspect of, 689
 with cast clasps, advantages claimed for, 506
 Rennick, Arthur, "A Trouble in the Casting of Gold Inlays" (correspondence), 232
 Report (unabridged) of Committee Appointed by the Lord President of the Council to Investigate the Extent and Gravity of the Evils Connected with the Practice of Dentistry and Dental Surgery by Persons Not Qualified under the Dentists Act, 1878. Presented to Parliament by Command of His Majesty, 525
 Re-revival of Dental Prosthesis (editorial), 172
 Research, dental, bibliography of, 637
 Resilient teeth, 348
 Resorption, the process of, occurring in teeth in dermoid cysts, 342
 Retainer, a removable, 449
 Retinal hemorrhage, bacterial toxin as a cause of, 254
 Rhachitis, description of, 101
 effects of, on the jaws, 1032
 Rhein, M. L., on what constitutes reinfection of root-canals and how can it be prevented? 1002
 Rhode Island Board of Registration, 448, 928
 Rial, B. P., on the dental nurse, 1233
 Rice, Earl C., on making and testing dental amalgam alloys, 885
 Ridge, relation of the teeth to, in a lower denture, 1038
 Roat, A. L., "Abscessed Teeth Can be Restored to Usefulness" (Hints), 677
 "To Fit a Backing to a Tooth" (Hints), 781
 Robin, Albert, "Osseous Demineralization and Its Treatment," review of, 503
 Robin, Pierre, "Daily Hygiene of the Mouth: Its Prophylactic Importance During Epidemics," review of, 421
 Robinson, Edw. P., "Is the Endameeba Buccalis the Real Cause of Pyorrhea?" 981
 Robinson, W. J., on "considering the wax pattern," 235
 Roentgen examination of the mouth, 745
 Roentgenograms, use of, in diagnosis of pulp diseases, 312
 Roentgenographic studies of tissues involved in chronic mouth infections, 251
 Rogers, A. P., "Orthodontic Appliances and Gingival Tissue," review of, 683
 Rollins, F. G., "Sinusitis: Its Relation to Abscessed Teeth," 752
 Rolsalsky, H. W., on what constitutes reinfection of root-canals and how can it be prevented? 1001
 Root, upper central, abscessed and punctured, treatment of, A. B. Crane on, 756
 Root abscesses, 624
 treatment of, 625
 Root amputation, 649
 instruments and accessories, 652
 selection of cases for, 651
 technique of anesthesia for, 652
 Root-canal, medication of, prior to operating, A. B. Crane on, 756
 Root-canal operations, 258
 Root-canal technique, a practicable, 1193
 accurate diagnosis the foundation principle of, 1195
 Root-canal treatment and filling, 53
 Root-canal work, A. B. Crane on, 757
 Root-canals, capillary attraction in the treatment of, 119
 chemical procedures in the opening of obliterated, 957
 reinfection of, what constitutes; and prevention of, 954
 sterilization of, 732, 956
 therapeutic evidence as to the sterility of infected, after-treatment with dichloramin-T, 962

- Root-canals, therapeutic procedures in the treatment of, 959
- Root-canals and bridge work, 348
- Root-filling, immediate, A. B. Crane on, 756
- Root infections, hopelessness of therapeutic measures in treatment of, 389
- surgery the only rational procedure in, 390
- Root resection, 41, 56, 196, 507
- a plea for a broader field, 388
- anesthesia for, 49
- contra-indications for, 47
- indications for, 45
- instrumentarium for the operation, 47
- post-operative treatment, 51
- technique of, 49, 196, 429
- the after-treatment of wounds resulting from, 197
- Root structures, degenerate, 1067
- Roots of teeth, abnormal collateral arterial development in, 827
- Rosenheck, Chas., "Reflex Convulsions During Dentition," review of, 87
- Roumaillac, "Cure of Neuralgia Under Fixation Abscess," review of, 1259
- Rowan, Edw, obituary of, 262
- Royal College of Dental Surgeons, commencement of, 698
- Rubber dam, consideration for the patient after removing, 255
- Rural dental clinic, 346
- Rust, removal of, from steel instruments, 1264
- SADDLES, gold, simple accurate technique for making, 90
- St. Louis University, School of Dentistry, commencement of, 808
- Salicylic acid, case of antral abscess treated with, 255, 787
- Saliva, human, amylolytic activity of, studies on, with a new method, 344
- nature of the, 23
- normal, does it contain uric acid (urate)? 425
- the, in pellagra, 785
- to protect synthetic cement fillings from, 89
- Salivary glands, sublingual and submaxillary, development of, in human embryos, 1260
- Salivary reaction, litmus as an indicator of the, 409
- Salivas, submaxillary and parotid, normal and pathological cytology of, 1156
- Salvas, J. Clarence, "Dental Care in Pregnancy (correspondence), 874
- on the relation of dental affections to systemic diseases, 666
- Sanitation, public, mental myopin *vs.*, 317
- Sarcoma, melanotic, or melanoma of superior maxilla, 786
- Sausser, Emerson R., "Root Resection," 41
- Savage, W. S., "An Easy Method of Applying Iodin" (Hints), 80
- Scheiman, Philip, "Painless Pulp Extirpation; Fractured Roots Remaining in the Jaw" (correspondence), 231
- Schlegel, Geo. S., "Response to Address of Welcome" (Pennsylvania State Dental Society), 1098
- Schmitt, E. G., "Report on Dental Science and Literature for the year 1918" (to Maryland State Dental Association), 976
- Scholl, C. R., "Reclaiming Used Wax" (Hints), 679
- School children, dental clinics for, 1032
- retardation among, defective oral conditions responsible for, 613
- School hygiene, a plan that solves the fundamental problem in, 607
- Schreiber, W. L., "Report of an Unusual Case of Third Molar Impaction with Complications," 111
- Schreiner, B. F., Burton T. Simpson, and Theodore Mueller, "Diagnosis and Treatment of Basal-cell Epithelioma," review of, 252
- Schuhmann, H. H., "Oral Foci of Infection from a Dentist's Standpoint," 1183
- Schwartz, H. B., "Checking of Gum Blocks" (correspondence), 412
- Schwartz, Phil L., "Removal of Redundant Gum Tissue Prior to Insertion of Full Upper and Lower Dentures" (Hints), 899
- "Treatment of Trifacial Neuralgia by Alcoholic Injections" (Hints), 679
- Scurvy, infantile, 341
- Separating disk, safe way of using, 81
- Septic foci, oral, some problems in the treatment of, 339
- Setting crowns and bridges, 347
- Setting of small inlay bridges, 1037
- Setting up teeth, to prevent inaccuracy in, 183
- Sharpe, William, "Operative Treatment of Trifacial Neuralgia," review of, 1263
- Shaw, D. F., "Perverted Functional Activity in the Production of Jaw Deformities," review of, 1153
- Sialophagia of central origin, 83
- Sicard, J. A., "Treatment of Essential Facial Neuralgia by Local Alcoholization," review of, 249
- Silverman, S. L., "Oral Surgical Cases in Practice," 942
- Sinclair, John F., "Some Influences of Diet Affecting the Second Dentition," 1260
- Sinus, maxillary, tuberculosis of the, 502
- Sinusitis, relation of, to abscessed teeth, 752
- Sixth International Dental Congress, Transactions of the (bibliographical), 1030
- Skin grafting, intra-oral; establishment of the buccal sulcus, 784
- "Skull, deformed, from Siwash Oasis," review of, 901
- Smith, A. L., "Dental Infections in Children," review of, 1155
- Smith, Arthur W., "The War and the Dental Profession" (Correspondent's Report, Dental Society of the State of New York, 1919), 866
- Smith, Sydney, "Some Biological, Physiological, and Clinical Problems in the Treatment of Oral Septic Foci," review of, 339
- Snow, Geo. B., "Checking of Gum Blocks" (correspondence), 660
- Society of Dental Science, N. S. W., announcement, 520
- Sodium hypochlorite, advantages of, in the treatment of septic wounds, 374
- Soft tissues, retracting and suturing of, with regard to the extraction of, 1092
- Soldering, 905
- gold, a "teaser" for, 336
- without pit, 676
- Soldiers, disabled, educating, 266
- Sound-images, C. S. Case on, 4
- South Carolina Board of Examiners, 273
- South Carolina Dental Association, announcement, 358
- South Dakota Board of Examiners, 360, 1058
- South Dakota State Dental Society, announcement, 358
- Southern California Dental Association, announcement, 708
- Spasmophilia; tetany, 102
- Spatulas, bone, 89
- Specialization in Dentistry (editorial), 775

- Speech, foundation principles in the mechanism of, 1, 134
- Spencer, Walter A., "President's Address" (Pennsylvania State Dental Society), 1099
- Spencer, Wm. H., and Chevalier Jackson, "Dental Broach in the Bronchus: Report of a Case," 201
- Spies, gold cap crowns used by, for secreting despatches, 505
- Splint, interdental, successful type of, 394
- Splints, interchangeable interdental, with attachment for extra-facial tension in, maxillo-facial surgery, 839
application and description of, 840
- Standardizer, the investing, 210
a universal, 210
- Standen, J. A., on the dental assistant, 1102
- Staphylococcemia simulating typhoid with relapses, 1260
- Staples, Harold, "Davis Crown Technique," 1222
- Starch, iodid of, as an antiseptic for wounds, 347
- Steele facings, backing for, 900
cementing, 687
one-piece backing for, 787
removing, from an old bridge, 677
- Steinbugler, W. F. C., "Dental Infection and Eye Diseases," review of, 181
- Stengel, Alfred, "Relation of Dental Affections to Systemic Diseases," 619
- Sterilizer, dental, A. B. Crane on, 756
- Stern, David S., "Chloramins in the Treatment of Pyorrhea," 1218
- Stevenson, A. H., on practical methods used to promote oral hygiene among school children, 1127
- Stewart, James, on the need for extension of public dental clinics, 1015
- Stillman, E. G., "A Study of Atypical Type II Pneumococci," review of, 421
- Stillman, Paul R., "A Biologic Aspect of Peridontia," 853
"Report of Committee on Practice" (Dental Society of the State of New York), 947
- Stippling the pink vulcanite, 686
- Stomatitis, apthous, 787
ulcerative, 259
- Strang, R. H. W., on the connection between artificial feeding and malocclusion, 164
on treatment of fractured jaws, 168
- Strecker, A. W., "Report of Several Cases of Grave Systemic Disturbance Doubtless Caused by Pathological Conditions of the Dental Organs," 216
- Streptococci, hemolytic, in the faucial tonsil, 421
use of blood agar for the study of, 681
- Streptococcus oral sepsis, 1034
- Streptococcus viridans infection, clinical picture of, 684
- Strip, to pass a, through a tight contact, 255
- Students' army training camps, the army authorities and, 93
- Styptic, a most effective, 89
- Submaxillary and parotid salivas, normal and pathologic cytology of, 1156
- Sullivan, M. X., and K. K. Jones, "The Saliva in Pellagra," review of, 785
- Supernumerary teeth, 89
- Suppurative gingivitis, with alveolar involvement; a new surgical procedure, 84
- Suprarenin, combination with novocain, 687
- Surgeon-general of the army, annual report of, 187
report of, on the present status of the dental corps, 263
- "Surgery of Oral Diseases and Malformations, Their Diagnosis and Treatment," by G. V. I. Brown (bibliographical), 74
- Surgery, in edentulous mouths, 788
maxillo-facial, interchangeable interdental splints with attachment for extra-facial tension in, 839
- Susquehanna Dental Association of Pennsylvania, announcement, 444, 817
- Sved, Alexander, "The Application of Engineering Principles for the Predetermination of Arch Outlines," 11
- Swaging with moldine, 905
- Swan, J. C., "A Trouble in the Casting of Gold Inlays" (correspondence), 70
- Synthetic cement fillings, to protect from saliva, 1158
- Syphilis as a factor in buccal leukoplakia, 1033
tertiary, of nose, absorption of premaxilla in, 419
- Systemic conditions and the teeth, 198, 258
- Systemic disease, to what degree are oral pathological conditions responsible for? 33
- Systemic diseases, relation of dental affections to, 619
- Systemic diseases and focal infections, 179, 184
- Systemic disturbance, grave, caused by pathologic conditions of the dental organs, 216
- Systemic disturbances due to infected teeth, 969
- Systemic disorders and devitalized teeth, 1177
- Systemic infection, age as related to the oral origin of, 621
- Systemic infection and oral lesions, relationship between, 711
- TAINTOR, MISS EVANGELINE, on the dental hygienist in the Surgeon-general's office, Washington, D. C., 1253
- Talano, G., "Trophic Lesions of the Face," review of, 420
- Talbot, Eugene S., "Histo-pathology of the Jaws and Apical Dental Tissues—"
(i) "Bone Absorption Around the Roots of Teeth," 361
(ii) "Abnormal Collateral Arterial Development in the Roots of Teeth," 827
(iii) "Epithelial Débris Located in the Peridental Membrane and Other Structures," 929
(iv) "Degenerate Root Structures," 1067
(v) "Development of the Peridental Membrane," 1213
- Taussig, Albert E., "Vertigo and Focal Infection," review of, 905
- Taylor, B. L., on the dental radiograph, 1010
on ulcero-membranous gingivitis, 1007
- Taylor, H. D., and Marianne G. Stebbins, "Action of Chlorinated Antiseptics on Blood-clot," review of, 255
- Teeth, factors which appear to promote decay of, 26
nature of the, 24
reckless sacrifice of the, 620
systemic conditions and the, 258
- Teeth and tonsils as causative factors in arthritis, 177
- Tempering explorers, 89
- Templeton, James G., obituary of, 430
- Tenner, Arthur S., "Bacterial Toxin as a Cause of Retinal Hemorrhage," review of, 254
- Tennessee, amendments to the dental law of, 692
- Tennessee Board of Examiners, 522
- Tennessee State Dental Association, announcement, 519, 816
- Testut, L., and L. Marchand, "Trigeminal Paralysis," review of, 421
- Texas Board of Examiners, 1057
- Texas State Dental Society, announcement, 191

- Thoma, Kurt H., "A Contribution to the Knowledge of the Development of the Submaxillary and Sublingual Glands in the Human Embryo," review of, 1261
- "Clinical, Roentgen, and Microscopic Diagnosis of Dental Conditions," 742
- Thomas W. Evans Museum and Dental Institute School of Dentistry University of Pennsylvania, commencement of, 798
- Thyroid, enlarged, due to impacted third molar, 1263
- Thyroid hormone and its relation to other ductless glands, 182
- Tic douloureux, with special reference to treatment by alcoholic injection, 503
- Tierney, J. T., and Wm. Engelbach, "Case of Hypopituitarism," review of, 83
- Tilly, Alfred F., obituary of, 1267
- Tissues, apical dental, histo-pathology of, 361, 827, 929
- Titus, H. W., "A Trouble in the Casting of Gold Inlays" (correspondence), 232
- Tixier, Léon, and Tobé, "The Complications of Vincent's Infection of the Oral Mucosa," review of, 338
- Todd, T. W., "An Introduction to the Mamalian Dentition" (bibliographical), 78
- Tompkins, H. E., "Concerning Gold Inlays," 629
- Tongue, cancer of the, 343
- Tonsil infection, 906
- Tonsillitis, ulcero-membranous, microscopic appearance of, 903
- Tooth brushing, vertical, 477
- Tracy, W. D., on the war and the dental profession, 879
- Transactions of the Inter-Allied Dental Congress, Paris, 1916, note as to, 1151
- Transillumination, use of, in diagnosis of pulp diseases, 311
- Treleaven, P. C., "Seventeenth Century Dental Instruments," 861
- Trench mouth and its treatment, 66, 233
- Trifacial neuralgia, treatment of, by alcoholic injections, 679
- Tripods, metal syringe, to prevent corrosion of, 1258
- Trueman, Wm. H., on "Dr. Jesse Cope Green's Relation to the Dental Profession's Uplift in the State" (address at banquet), 322
- Tuberculosis of maxillary sinus, 502
- "Tube Teeth and Porcelain Rods," by John Girdwood (bibliographical), 673
- Tufts College Dental School, commencement of, 914
- Tulane University, School of Dentistry, commencement of, 696
- Tumor, an operable, involving the Gasserian ganglion, 86
- Tumors in the mouth, early recognition of, 426
- of the jaws, malignant, 249
- of the upper jaw, treatment of, with cautery, 341
- Tunncliffe, Ruth, "The Microscopic Appearance of Ulcero-membranous Tonsillitis (Vincent's Angina)," review of, 903
- ULCERATIVE gingivitis, acute, 180
- Ulcero-membranous gingivitis, the gingival phase of Vincent's disease, 819
- (correspondence on), 1095
- Ulcerative stomatitis, 259
- United States service, the dentist in the, 948
- University of Buffalo, Dental Department, commencement of, 1045
- University of California, College of Dentistry, commencement of, 806
- University of Illinois, College of Dentistry, commencement of, 804
- University of Iowa, School of Dentistry, commencement of, 913
- University of Louisville, College of Dentistry, commencement of, 803
- University of Maryland, Dental Department, commencement of, 797
- University of Michigan, College of Dental Surgery, commencement of, 807
- University of Minnesota, College of Dentistry, commencement of, 915
- University of Nebraska, College of Dentistry, commencement of, 695
- University of Pittsburgh, School of Dentistry, commencement of, 912
- University of Southern California, College of Dentistry, commencement of, 1043
- University of Tennessee, College of Dentistry, commencement of, 803
- University of West Tennessee, College of Dentistry, commencement of, 695
- Utah Board of Examiners, 523
- VACCINE, autogenous, one hundred cases treated with, 345
- Vaccination, the record of, 1037
- Vail, Captain, on co-operation between the members of the dental and the medical professions, 1143
- Vanderbilt University, School of Dentistry, commencement of, 695
- discontinuance of, 810
- reopening and reorganizing of, 897
- Van Horn, C. S., "Considering the Wax Pattern," 204
- "President's Address" (Pennsylvania State Dental Society), 147
- Van Vleck, Chas. King, obituary of, 1040
- Venereal Disease and the Public Health (editorial), 1149
- Venereal diseases, campaign to enlist the co-operation of the dental profession in the fight against, by the Bureau of the Public Health Service, Washington, D. C., 1132
- Vermont Board of Examiners, 273
- Vermont State Dental Society, announcement, 191, 519
- Vertigo and focal infection, 905
- Victory Liberty Loan, The (editorial), 333, 418
- Vincent's angina, 504, 680
- microscopic appearance of, 903
- Vincent's disease, chronic metal poisoning as a cause, 824
- danger of instrumentation, 823
- diagnostic symptoms, 822
- history, classification, and terminology of, 820
- pathology of, 821
- predisposing oral conditions, 824
- treatment of, 826
- Vincent's infection of the oral mucosa, complications of, 338
- Virginia Board of Examiners, 359
- Virginia State Dental Association, announcement, 810
- Vomiting and nausea in anesthesia, 907
- Vowels and consonants, oral elements of, 134
- Vulcanite, firm attachment of, to aluminum dentures, 1037
- pink, stippling the, 686
- Vulcanite dentures, repairing, 183
- Vulcanite tooth, replacement, 426
- Vulcanite work, polishing, 686
- WAR, the, and the dental profession, 866, 875
- War, The Dental Lesson of the (editorial), 414

- War casualties, fractures of the mandible and maxilla from, use of orthodontic appliances in the treatment of, 128
- War fractures of the jaws, ununited, treatment of, 455
- Ward, Marcus L., "A Trouble in the Casting of Gold Inlays" (correspondence), 232
- "Modern Tendencies in Bridge Work," 1169
- Warner, Chas. T., "Forsyth Day" at the Forsyth Dental Infirmary, 668
- Warsaw, Philip, "Relation of Caries to Pyorrhea; Symmetrical Caries" (correspondence), 320
- Washing amalgams, 89
- Washington State Board of Examiners, 445
- Watling, John A., obituary of, 351
- Waugh, L. M., on the use of orthodontic appliances in the treatment of fractured jaws due to war casualties, 167
- Wax, burning out, from a casting investment, 688 used, reclaiming, 679
- Wax pattern, carving the, in inlay work, 207 consideration of the, 204 investing the, 208
- Wedelstaedt tube, the, 736
- Weinberger, B. W., on the connection between artificial feeding and malocclusion, 164
- Wells, F. M., "Food Deficiencies as a Factor Influencing the Calcification and Fixation of the Teeth," review of, 786
- Wells, Horace, mankind's greatest benefactor, 28
- Western Dental College, commencement of, 696
- Western Reserve University, School of Dentistry, commencement of, 797
- Wheeler, J. M., "Paralysis of the Sixth Cranial Nerve Associated with Otitis Media (Gradenigo's Syndrome or Triad)," review of, 87
- Whiteman, J. D., on the dental nurse, 1225
- Williams, D. B., "Case Report Showing the Value of the Radiograph as a Protective Factor in Dental Practice," 486
- Winsor, Chas. Dudley, obituary of, 432
- Wiring corresponding teeth of superior and inferior maxillæ in fracture of inferior maxilla, 1038
- Withers, John W., on the dental clinic in relation to our educational system, 1016
- Wolf, H. F., "Clinical Picture of Streptococcus Viridans Infection," review of, 684
- Womer, W. A., "One Hundred Cases Treated with Autogenous Vaccine," review of, 345
- Wonderful Year, The (editorial), 71
- Woolverton, James I., on G. V. Black's method of making and testing dental amalgam alloys, 883
- Worthley, B. L., and D. H. McCauley, "Treatment of Ununited Fractures of the Jaws: *Résumé* of Work Done by Dental Dept., U. S. Army General Hospital No. 11, Cape May, N. J.," 391, 455
- Wyoming Board of Examiners, 522
- X-RAY, achievements of, in the army, 265 an essential in the dental office, 907 as an aid in diagnosis, 1196 case illustrating the value of, as a positive diagnostic aid, 336 influence of, on oral surgery, 728 infectious areas and the, 184 limitations of, in diagnosing dental lesions, 183 value of, in diagnosis of dental conditions, 727
- X-ray pictures, case report showing the value of, as a protective factor in dental practice, 486 interpretation of, 257, 759 uncertainty of, 1191
- YOUNG, J. LOWE, on the use of the expansion arch for the treatment of fractured jaws, 166
- ZARRISKIE, ANGELO, "Complement Fixation Tests as Applied to Dental Practice," review of, 1034
- Zentler, Arthur, "Suppurative Gingivitis with Alveolar Involvement: A New Surgical Procedure," review of, 84
- "The Use of Orthodontic Appliances in the Treatment of Fractures of the Mandible and Maxilla from War Casualties," 128
- Zinc oxid and oil of cloves, 90, 259
- Zsigmondy, Otto, obituary of, 1162
- Zurbrigg, D. A., on G. V. Black's method of making and testing dental amalgam alloys, 886

Who Bears the Cost of Advertising?

SOME say the "advertiser" and others insist that you will find it hidden somewhere in the cost to the ultimate consumer.

It is true that the advertiser actually "pays" the bills, and it is also true the money comes from the ultimate consumer but it does not necessarily follow that either bears the cost.

Any manufactured products in competition must necessarily bear a certain share of overhead expense for making and selling, which is greater or less per unit according to the number sold.

Advertising concentrates demand and distributes overhead cost over a larger output, thus permitting a greater total profit to the makers of advertised products on a smaller margin per item. Other things being equal the bulk of the overhead cost for making and selling advertised and non-advertised goods must therefore fall on the non-advertiser.

The presumption and the proof is that continuously advertised goods must be "good" goods or

they could not continue to be advertised. It is axiomatic that no one can afford to continuously advertise goods without merit.

Non-advertised goods may or may not have merit, there is no assurance of reliability for the purchaser. On the other hand, the necessarily restricted output of non-advertised goods forces the prices up or the quality down and the consumer loses in either case.

If advertising brings more profit to the advertiser and better value to the consumer of advertised products, it is plain that both gain by the operation.

Conversely, if the non-advertiser pays the bulk of the overhead cost for making and selling because of his restricted output and is obliged to pass part of it on to the consumer of non-advertised products in the form of higher prices or lower quality, the cost of the advertising which created this situation must be divided between the *non-advertiser and the buyer of non-advertised goods.*

Serviceability

WHITE-ALLOY Pin Teeth are like most other worth-while products—they have more than surface value. What makes them especially desirable is their serviceability—strong porcelain, tough pins.

White-Alloy pins made of a nickel-base alloy which is specially treated, have unusual toughness; it is this toughness which insures a secure attachment and long denture service.

White-Alloy Pin Teeth for Vulcanite Work

PRICES

Single	-	-	-	-	-	-	\$0.12
Combination Sets of 14	-	-	-	-	-	-	1.00

\$100.00 Lots

Single	-	-	-	-	-	-	.10 ⁸
Combination Sets of 14	-	-	-	-	-	-	.90

Subject to change without notice and to our regular cash discounts

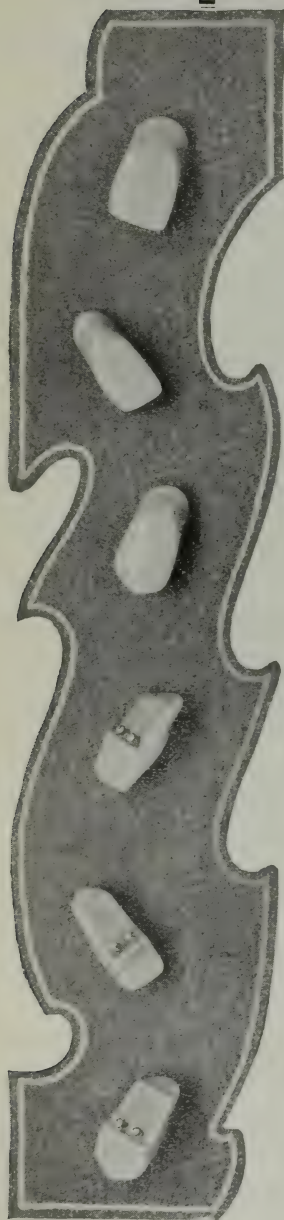
For Sale by Dental Dealers and at our Houses

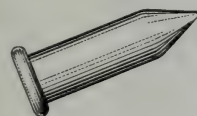
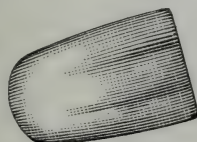
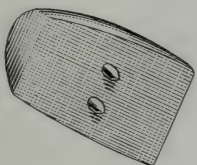
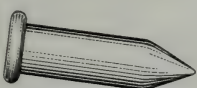
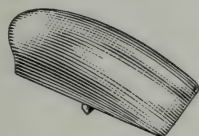
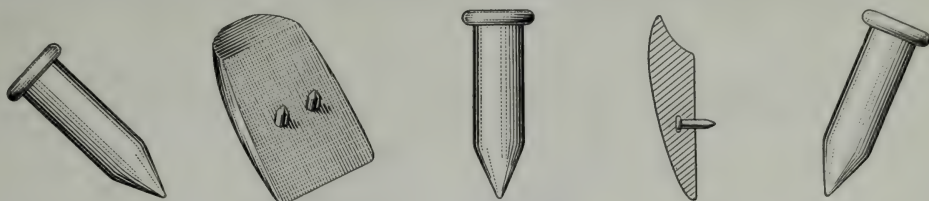
The S. S. White Dental Mfg. Co.

"Since 1844 the Standard"

Philadelphia

New York	Boston	Chicago	Brooklyn
Atlanta	Oakland	San Francisco	





A Remedy for An Old Evil

An accident which often happens in the making of crown- and bridge-work is a "check" in the porcelain. You have done a deal of work preparatory to the soldering, and a checked facing means that all your work has been wasted.

This check may be due to any one of many causes, but one of the worst offenders is the flux, which works its way through the pin-holes between the backing and the porcelain. This is due oftentimes to faulty pin construction—pins without symmetry of form.

S. S. WHITE POINTED-PIN FACINGS

The pins of S. S. White Pointed-Pin Facings are cut with absolute accuracy from end to end. They fit the holes in the backing so snugly that no flux can get through.

Here is one way to go about the work. The pointed pins punch their own holes with slight pressure against soft wood or cork after you have placed them against the backing to mark their position. It then takes but a moment to burnish down the bur of gold around the pin.

This technique, if carefully followed with our pointed-pin facings, will remove a fruitful cause of checking.

S. S. White Pointed-Pin Facings
Each - - \$0.45

Price subject to change without notice

For sale by dental dealers and at our houses

The S. S. White Dental Mfg. Co.

"Since 1844 the Standard"

Philadelphia

New York
Atlanta

Boston
San Francisco

Chicago
Brooklyn
Oakland



Forhan's Pyorrhea Astringent Sold Only to Dentists

To guard against the misuse of Forhan's Pyorrhea Astringent, the Forhan Company does not sell this preparation to retail druggists. At no time since the Astringent was originated and prepared for dental practice has this policy ever been departed from. *Dentists only* can buy this preparation—which is a recognized healing agent in the treatment of pyorrhetic conditions of the gums. For sale to the profession through the drug house.

Forhan's For the Gums (Liquid)

The liquid form of Forhan's For the Gums is now on the market. While not a cleansing agent as is Forhan's Paste, it contains an efficient percentage of Forhan's Pyorrhea Astringent and is well adapted to the home use of the pyorrhea patient. Used as a mouth wash, for gum massage, or on the brush, Forhan's Liquid For the Gums is healing, stimulative and antiseptic in effect. Available to the consumer through the retail druggist.

Forhan's For the Gums (Paste)

An excellent cleansing agent and auxiliary to professional treatment for pyorrhea. It contains sufficient Forhan's Astringent to make it valuable for its effect on spongy gums, but it is not over-medicated. Forhan's For the Gums (Paste) is of the consistency that encourages massage. It is healing and mildly antiseptic. Many dentists prescribe it for the daily use of the pyorrhea patient. Available to the public through retail druggists.

FORHAN COMPANY
NEW YORK

FORHANS LIMITED
MONTREAL



MADE BY
THE J. M. NEY COMPANY

HERE are text books that give formulae for high-grade alloys. They also describe authoritatively the right methods of manipulation.

The profession requires of the manufacturer that he furnish an alloy to meet the specifications. There are several alloys measuring up to the requirements, variously priced.

Ney-Aloy

goes to you with a published formula; it is equitably priced; it is made by a company which has been furnishing the profession precious metal products for over a hundred years.

Price, 1 oz. \$2.00; 5 ozs. \$8.50

THE PIONEER  THE LATE JOHN M. NEY	MANUFACTURED BY The J. M. NEY COMPANY  President HARTFORD, CONNECTICUT, U.S.A.	NEW GOLD FOR OLD GOLD SILVER PLATINUM ETC.
--	---	--

Ney's Golds and Solders, "Best Since 1812," and Ney-Aloy, sold by all good Supply Houses.
 If your dealer cannot supply you, write to us.

"I am very careful as to what preparations I endorse. I often recommend Colgate's."

(Name of writer on request)

THIS dentist wrote as above because he finds Colgate's Ribbon Dental Cream an "able assistant" in keeping his patients' teeth in good condition. Very likely you echo his sentiments.

Colgate's cleans the teeth without acids or harmful grit. It helps to keep your work in good condition by its delicious flavor which encourages twice-a-day use of the tooth-brush. Colgate's is *Safe to use every day.*

If you use RIBBON DENTAL CREAM at the chair and recommend it to your patients, you are already familiar with its merits. If not, Colgate & Co. will be glad to send you a professional package by which you can test the merits of Ribbon Dental Cream. Please use your office stationery or enclose your professional card.

COLGATE & CO.

Dept. XX 199 Fulton Street New York
Makers of Colgate's Dental Powder



20TH CENTURY ALLOY ~ PERFECTED ~

Scientific Amalgam Work

implies the use of an alloy scientifically made, whose properties have been scientifically determined, and whose "directions for use are based on scientific data of that one particular alloy, translated into and for everyday, practical use.

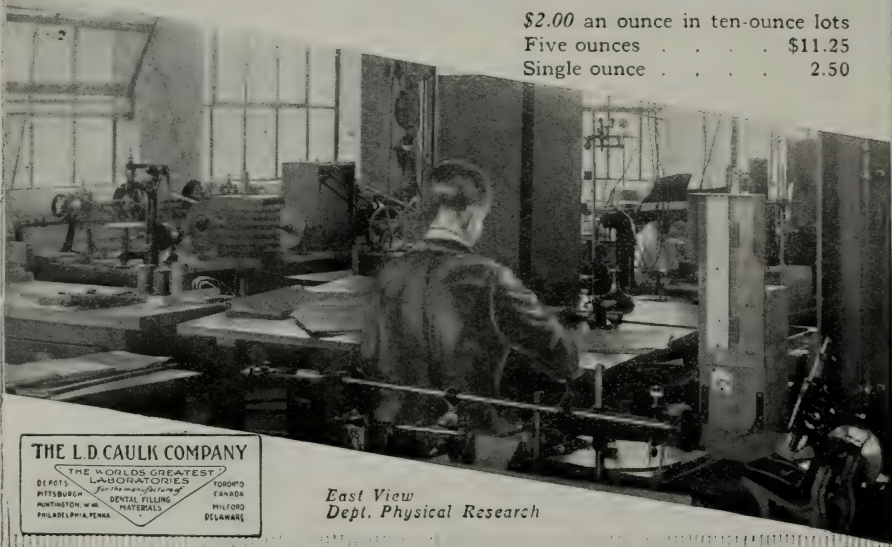
When it is remembered that in the testing of *T. C. Alloy* an accuracy of volume reaction measurements greater than one five-hundred-thousandths inch is obtained, the high type of equipment and personnel becomes an obvious fact.

The most highly refined metals, the most painstaking workmanship and care, and the most exacting tests, make *Twentieth Century Alloy* the finest alloy it is possible to produce.

Twentieth Century Alloy has back of it what no other alloy now has or ever had—a *Research Laboratory* whose time is devoted exclusively to dental alloy problems and improvements.

Yet T. C. Alloy costs no more than it ever has.

\$2.00 an ounce in ten-ounce lots
Five ounces \$11.25
Single ounce 2.50



THE L.D. CAULK COMPANY

THE WORLD'S GREATEST
LABORATORIES
for the manufacture of
DENTAL FILLING
MATERIALS
DEPOTS: PITTSBURGH, PHILADELPHIA, PENNA.
TORONTO, CANADA
MILFORD, DELAWARE

East View
Dept. Physical Research

Caulk Zinc Cement —plus Copr-Zinc

Setting a crown or a bridge is the final step of an exacting dental operation. It is designed to last for years. The patient expects it to and you assure him so. The anchoring cement is your only insurance against failure.

Caulk Zinc Cement —plus Copr-Zinc *is preferred insurance*

It mixes smoothly, velvety, without hurry, without worry. Three and four post abutment canals can be carefully filled and the bridge accurately placed before initial hardening begins. *Caulk Cements—plus Copr-Zinc*—protect the abutments against recurrent decay. They anchor crowns and bridges immovably—permanently.

Single color package—one powder and liquid—Copr-Zinc free
\$2.00

Six-color package—Six powders and liquids—Copr-Zinc free
\$10.00

At dealers everywhere



Industrial Chemical Dept.

THE L.D. CAULK COMPANY

THE WORLD'S GREATEST
LABORATORIES
for the manufacture of
DENTAL FILLING
MATERIALS

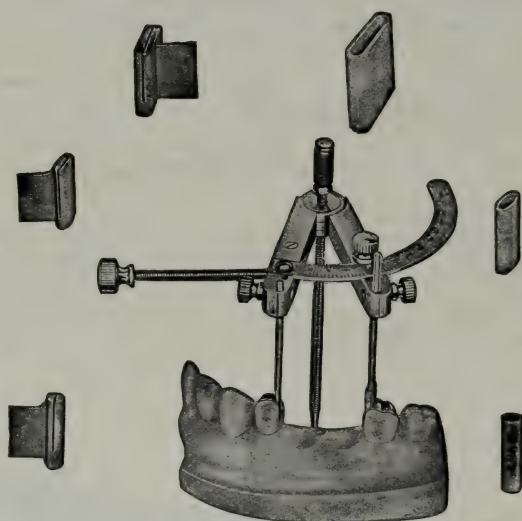
DEPOTS
PITTSBURGH
HUNTINGTON, W. VA.
PHILADELPHIA, PENNA.

TORONTO
CANADA
MILFORD
DELAWARE

Important Announcement

Removable Bridge-Work within reach of all

Dependable Parallelometer and Attachments



Slots in the tubes to be cut after soldering

These two essential requisites for the construction of the removable bridge-work, have just been patented and are now being offered to the profession at a reasonable price.

The BROWN-MAIER DENTAL PARALLELOMETER is so constructed that it can be successfully used with any of the attachments now being employed in the construction of removable bridge-work.

The BROWN ATTACHMENT is a small compact attachment based upon the principle of the split-pin and tube, and is so constructed as to make it especially adaptable to vital teeth. There are three kinds of BROWN attachments manufactured:

- (1) round split-pin and tube
- (2) oval split-pin and tube
- (3) flat split-plate and box

The round attachments are made in three sizes: large, medium and small.

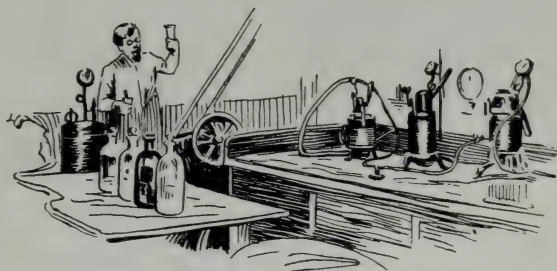
Illustrated Booklet written by Dr. I. Brown of New York City giving a concise course on the technique of removable bridge-work is furnished with each instrument.

For further information regarding literature and prices, apply to

Columbia X-Ray & Electric Corp.

131 East 23rd St.

New York



“Better Dental Rubbers”

INTENSIVE study of rubber compounds has resulted in better materials for denture building. The research laboratory at our Staten Island Factory made systematic investigations of basic materials and methods of compounding, extending over a number of years.

S. S. WHITE DENTAL RUBBERS, today, bear convincing testimony of the thoroughness of our chemists' work. A booklet “Better Dental Rubbers and How to Use Them” tells the story and cannot fail to be helpful to every rubber user.

Ask for a copy, to be mailed free

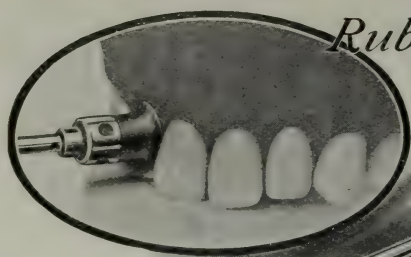


THE S. S. WHITE DENTAL MFG. CO.

“Since 1844 the Standard”

PHILADELPHIA

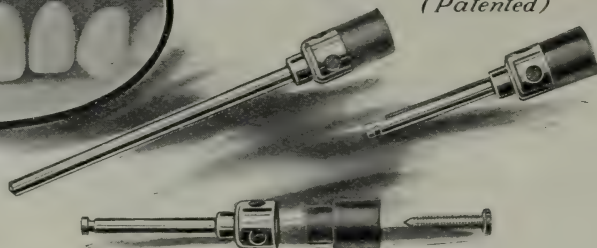
*Thirteen Fine Rubbers
Your Dealer Will Supply You*



Rubber Polishing Cup and Mandrel No. 323

*Invention of Dr. Charles H. Davis.
(Patented)*

*For Chuck
and Angle
Handpieces*



Stock Replenished

First advertised in June 1919, and two generous manufacturing lots sold since then; rather convincing argument; influenced a decided increase in our factory orders, and we now have them coming continuously.

A SMALL, thin-edge soft rubber cup and a mandrel adapted for it. The very soft rubber of the cup allows it to spread with little pressure over the irregularities of the teeth, carrying the abrasive right up to the gum or adjacent teeth without injury to them.

A cylindrical socket on the mandrel holds the cup firmly, and makes fully effective the features of the design, a deep rubber cup with the edge tapered to paper thinness.

Three holes in the side of the socket increase the hold on the cup as the screw forces the rubber into the socket, and rotation in either direction does not loosen the cup.

Mandrels are nickel-plated; made for chuck and angle handpieces; and the cups are interchangeable. The advantage of this little arrangement is obvious and you can prove it at a trifling cost.

Mandrel No. 323 each \$0.35

Davis Rubber Polishing Cups, per doz. .40

Your Dealer Will Supply You

The S. S. White Dental Mfg. Co.

"Since 1844 the Standard"

Philadelphia



From Disk to Crown

Drawing and Swaging are tests of ductility that show the superior qualities of

S. S. WHITE GOLD SHELLS AND DISKS

Malleability denotes a property almost the equivalent of ductility but it signifies the susceptibility to change of form by pressure, more than the capability of a material to be drawn out to extended length.

In both properties, pure gold surpasses all other metals, with silver and copper close competitors. Alloys of the three metals will exhibit these valuable characteristics only as the purity of the metals is maintained.

S. S. White Gold Shells and Disks are recognized as "easy working" because they are made of refined gold in a 22 karat alloy with pure silver and copper. They are soft when you get them notwithstanding their polish. They can be swaged and annealed again and again without splitting or blistering.

Your Dealer Will Supply You

The S. S. White Dental Mfg. Co.

"Since 1844 the Standard"

PHILADELPHIA

Ask for booklet "Uncompromising Gold for Prosthetic Dentistry"

Are Your Patients Comfortable?

TO make your patients comfortable you must use an Operating Chair built on right principles, one that does not require you to make complicated adjustments for each occupant.

THE RITTER CHAIR is designed to meet anatomical requirements. Placed in the standard operating position, raising or lowering the headrest is the only change necessary for ordinary work.

Other adjustments when required are made by a slight touch of the lock levers—no catches to unfasten—no wheels to turn.

It almost adapts itself to a position which is comfortable both to yourself and your patient.



Ritter Chair
Standard Position



Ritter Dental Mfg. Co., Inc.
Rochester, N. Y.

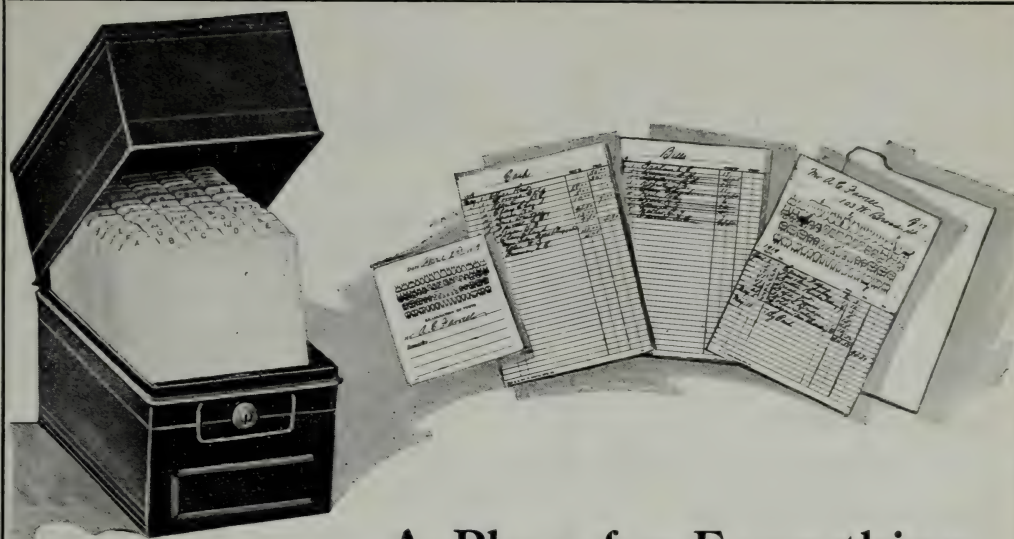
New York

Chicago

Philadelphia

Boston

Kansas City



A Place for Everything

and every thing in its place. That's the idea in the S. S. White Card Index System No. 2.

A trustworthy memory is a valuable asset but it should not be burdened with memoranda that can be kept on cards. Adopt a good system for keeping your accounts, a system that enables you to keep a complete record of your work with the least mental or manual effort.

S. S. White Card Index System No. 2 provides for three groups of records—

Active—Work in progress.

Pending—Work done but not fully paid for.

Closed—Accounts settled.

Three alphabetical guides of different colors enable you to locate any account quickly—you can see at a glance work performed, time consumed, charges made, payments received.

Complete outfit comprises a japanned metal case with lock and key; 300 Record Cards, 3 sets Guides, 50 Examination Blanks, 25 Cash or Bill Cards, and Folio Block (Card Support).

Price complete \$7.00

The S. S. White Dental Mfg. Co.

"Since 1844 the Standard"

Philadelphia

*Descriptive Booklet and
Sample Cards Free on Request*

Articulators
Blowpipes
Boiling Burners
Broach Holders
Brush Wheels
Buffalo Broaches
Bunsen Burners
Case Heaters
Cone-Socket Handles
Cotton Holders
Felt Wheels and Cones
Flasks
Flask Presses
Foot Blowers
Gasoline Gas Outfits
Gold Files
Heating Tripods
Plaster Knives
Plaster Spatulas
Rubber Files
Soldering Blocks
Swaging Anvils
Vulcanizers
and
Puscure

Buffalo Dental Mfg. Co.
BUFFALO, N. Y.
U. S. A.

Right Now

as much time and money is being spent on the proper equipping of dentists' laboratories as is being spent on beautifying dental offices.

And why not?

Of course your patient rarely sees your laboratory, but you see it every day, and there is no reason why it should not reflect you just as much as your office does.

How can you expect to maintain your sense of cleanliness and order if you divide your time between beautifully equipped and spotlessly clean operating room and an unkempt laboratory equipped with a lot of rusty old junk?

Take a good look at your laboratory and we'll venture to say you will find that fully fifty per cent. of the equipment is not only obsolete, but is actually worn out.

We are specialists in laboratory equipment.

We have catalogs and booklets covering our line of prosthetic apparatus, and we would like to send you literature concerning the items you decide to replace.

Which shall it be?

KOLYNOS

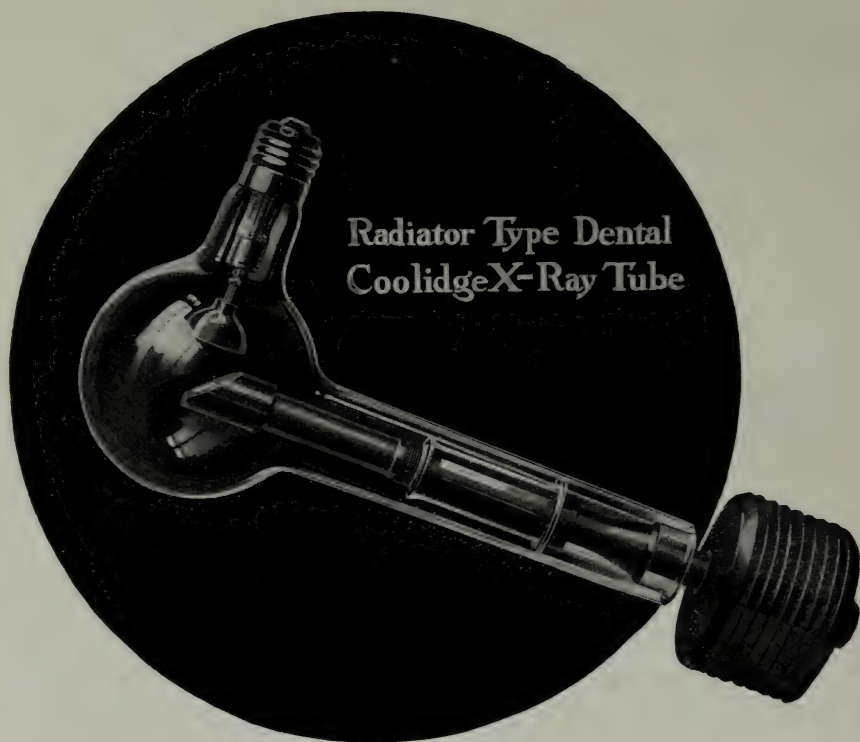
Additional Uses

No. 2

In Prophylaxis, when cleaning the teeth with pumice, use Kolynos Dental Cream as a binder or add Kolynos to the brush at the end of the operation. The patient will comment upon the pleasant and refreshing condition of the mouth. The antiseptic and disinfecting properties are additional reasons for its application.

Upon request a dental package of Kolynos will be gladly sent, charges prepaid.

THE KOLYNOS CO.
NEW HAVEN, CONN.



The Radiator Type Dental Coolidge X-Ray. Tube was designed to meet the special requirements of dental radiography.

To safeguard the patient from accidental electric shock and for convenience of manipulation, the cathode in this tube is arranged at right angles to the anode.

This tube is furnished only for use with X-Ray machines specially designed for its operation.

*Write your X-Ray apparatus manufacturer
or the address below*

35B-33

General Electric
General Office
Schenectady, N.Y. **Company** Sales Offices in
all large cities

I'VE CUT OUT *the* FUSSING

NOTE
THE
ANGLE



... since the day I introduced myself to—

JELENKO'S LINGUAL BARS

I can remember when I had to bend a bar into shape, to make it fit each individual case, but now, JELENKO does that for me.

And there's a big improvement in the fit, wear and comfort of the cases I turn out now—the angular bevel takes care of that.

After your first trial you'll say the same as I do, and the next time you buy you'll

INSIST UPON JELENKO'S

PRICES

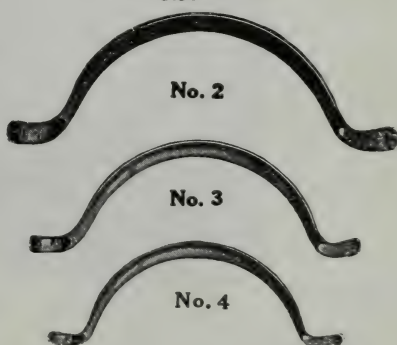
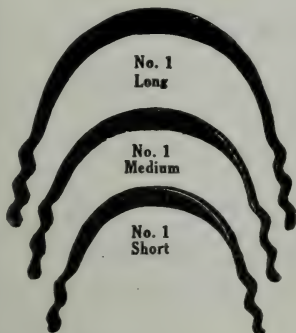
18 kt. <i>Cased Bars</i> (Guaranteed one-fifth part gold)	
Any size, each	\$1.50
Per dozen	15.00
16 kt. <i>Solid Gold Bars</i> —No. 1 Long and No. 2	
No. 1 Med. and No. 3	2.50
No. 1 Short and No. 4	2.25
18 kt. <i>Solid Gold Bars</i> —No. 1 Long	
No. 1 Med.	2.00
No. 1 Short	4.00
	3.75
	3.50

*For Sale by all Dental
Depots*

J. F. Jelenko & Co.

MANUFACTURERS OF
DENTAL GOLD AND
SOLDER

1 Union Square
New York, U. S. A.

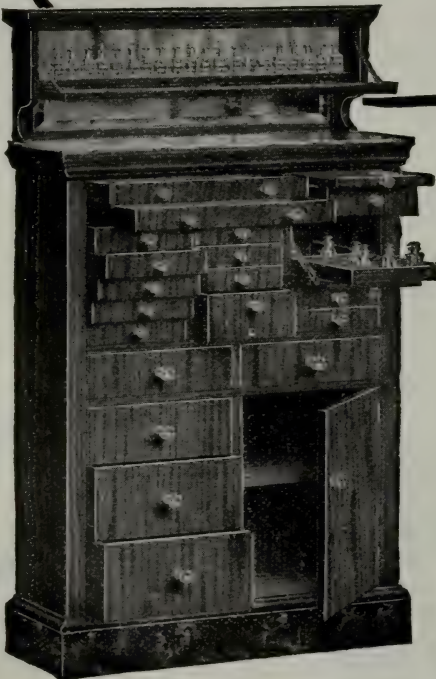


See the medicine top

Count the labelled bottles—16 of them—and every one of them instantly available.

See the Verde Antique marble base; the mirror back of the bottles; the white glass working surface; the special compartment for cements and instruments for working it.

The entire cabinet—as shown—is conveniently and superbly designed for either the crowded or spacious office.



No. 97 Cabinet Open

FURNISHED

in quarter-sawed oak, any finish, vertical grain mahogany, crotch mahogany, or Circassian walnut.

DIMENSIONS:

Height, 57½ in.; depth, 12 in.; width, 35 in.

**The American
Cabinet Company**
TWO RIVERS, WISCONSIN

In Good Company

VOLUME of sales is a matter of pride, and a constant temptation for a manufacturer to boast. A mere comparison of output, to impress the prospective purchaser, is not of itself an argument conclusive or significant of virtue without the support of convincing reasons for the apparent popularity of the article.

S. S. White True Dentalloy has an enviable history of success as a filling material since its introduction nineteen years ago. Those who have been constant users know it has never failed; its present widespread favor is the result of a steady growth.

For him who has recently adopted it, and for him who contemplates its employment, there is satisfaction and confidence in the fact that thousands of the best dentists have given True Dentalloy their unqualified approval.

True Dentalloy

In one-ounce and five-ounce bottles
Filings or shavings

1-ounce bottles, per ounce	.....	\$2.50
5 " lots " "	.....	2.25
10 " " " "	.....	2.00

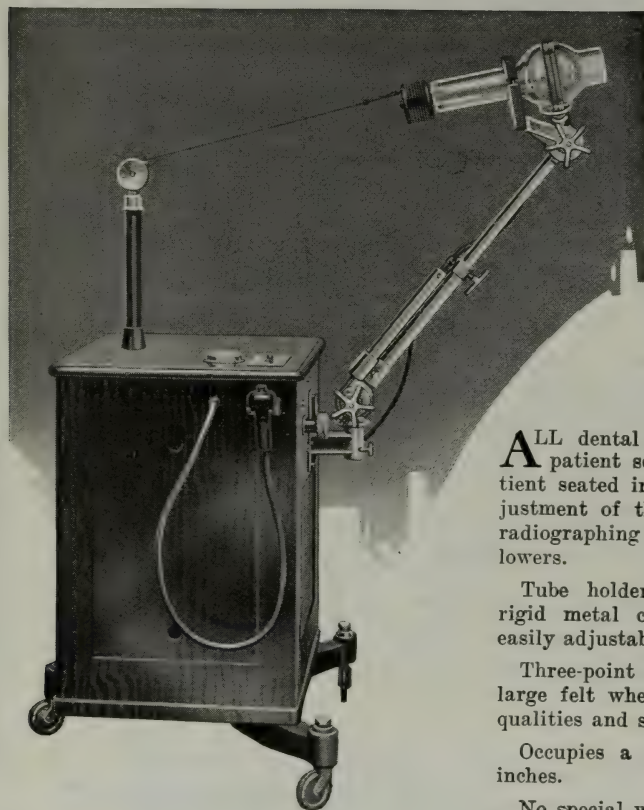
Send for Booklet No. 1531-A

Your Dealer will supply you

The S. S. White Dental Mfg. Co.
"Since 1844 the Standard"
Philadelphia

TRADE **TRUE** MARK
REG. IN U.S. PAT. OFFICE





Model 310

Bulletin 310 gives detailed description—Shall we send it?

The “L-F”

Model 310 Coolidge Dental X-Ray Unit

ALL dental radiography can be done with patient seated in dental chair. With patient seated in a separate chair, only one adjustment of the tube holder is necessary for radiographing uppers and one adjustment for lowers.

Tube holder is fully counter-balanced, of rigid metal construction, nickel plated, and easily adjustable to every position.

Three-point suspension of the entire unit on large felt wheel casters provides easy rolling qualities and stability on uneven floors.

Occupies a floor space of only $18\frac{1}{2} \times 18\frac{1}{2}$ inches.

No special wiring is necessary—can be operated from an ordinary lamp socket.

Is General Electric equipped throughout, using the General Electric Co. Coolidge X-Ray tube, lead glass protective shield, transformers, control, milliampere meter and hand switch.

Being General Electric equipped throughout assures the purchaser of the most advanced designs; guaranteed by the largest manufacturer of electrical apparatus in the world; and the unit is produced by an organization which has for over six years enjoyed an enviable reputation for quality products; yet the complete equipment costs no more.

The Liebel-Flarsheim Co.

410-16 Home Street Cincinnati, O., U. S. A.

The Liebel-Flarsheim Co., Cincinnati, O.:

Please send me Bulletin 310 and complete information on Coolidge Dental X-ray Unit.

I have _____ volts direct current. I have _____ volts _____ cycles alternating current.

Dr. _____

Street address: _____ City _____ State _____

Two View Points—

Our faith in S. S. White Pulp-Canal Cleaners is based upon actual facts concerned in their manufacture.

The continuous and increasing demand signalizes the satisfaction their use affords the dentists.

From either view point the same conclusions are inevitable—

S. S. White Pulp-Canal Cleaners
do their work properly—they
are reliable and therefore economical.

In Packages of One Dozen, \$0.80

Half Gross . . . 4.50

Gross . . . 8.00

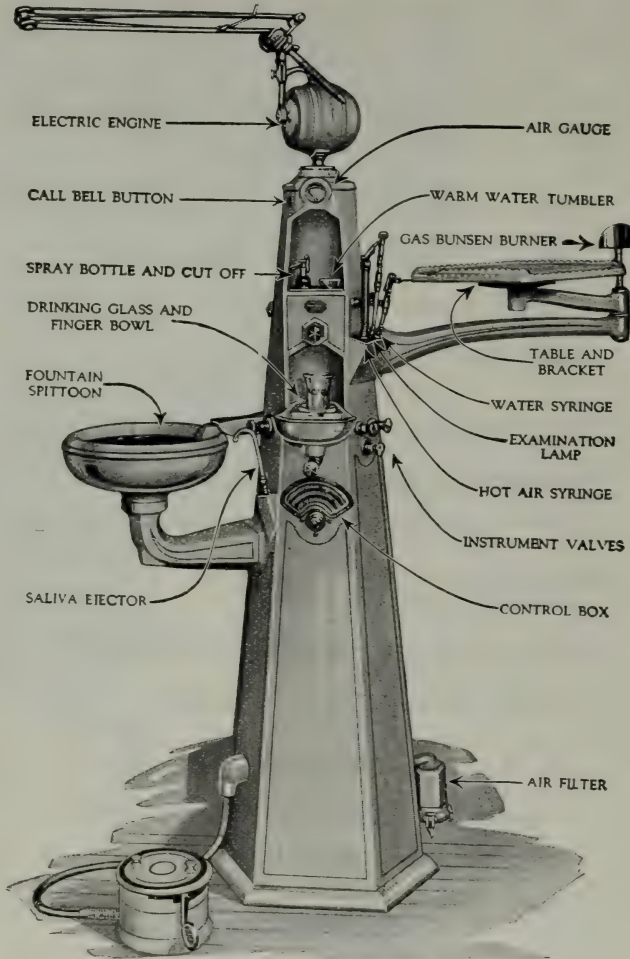
The S. S. White Dental Mfg. Co.

"Since 1844 the Standard"

Philadelphia

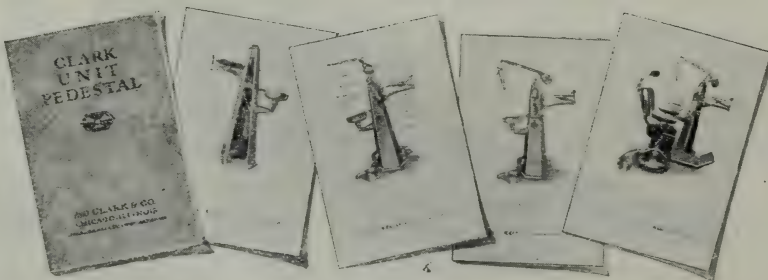
*Your Dealer Will
Supply You*





CLARK UNIT PEDESTAL

Send for the new Unit catalog—Just off the Press



A. G. CLARK & CO.

Grand Crossing, CHICAGO, ILL.



ELIMINATE false motions and you have the foundation of "Personal Efficiency." This is an axiom and is true in any field of endeavor.

This thought gives special significance to the portability and extremely convenient arrangement of

The New **REID** Portable Electro-Pneumatic Distributing Unit

Because of its highly flexible portability the instrument board can be instantly placed in the exact position where it will be most conveniently reached—where false motions will be eliminated. Because of the design there is no lost motion in going from the rheostat to the air control or the instrument rack as all of these features are centrally located and within a few inches of each other. Similarly, the thought of eliminating false motions has been extended to the finest detail in the construction of the equipment.

But important as this is, it is not all. The construction of the unit from first to last is thoroughly dependable. It is simple, sturdy and has been designed to give years of satisfaction—free from interruption and annoyance.

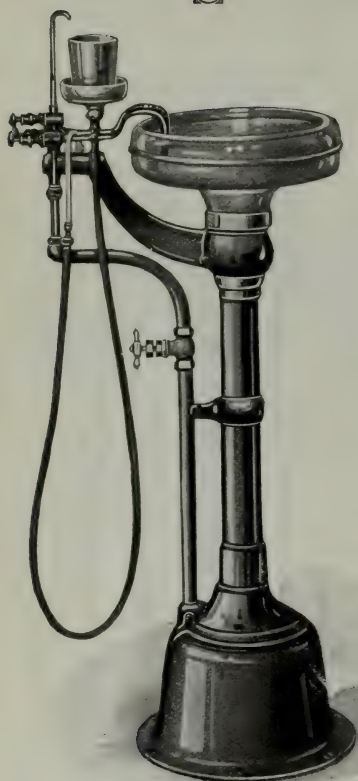
An investment in equipment of this kind is not a luxury, but a necessity, and the man who denies himself the assistance which it offers is paying for it many times over, though entirely unconscious that this is the case.



Illustrated Circular on Request

J. E. REID INSTRUMENT CO., INC.
408 NORTH 12th STREET PHILADELPHIA, PA. U.S.A.

Spittoon Stand No. 1



31 inches high. Pedestal finished in any standard enamel. Small metal parts polished nickel.

WHERE a simple, silent, self-cleansing spittoon is wanted; in the extracting room or in the operating room of the specialist, the Spittoon Stand No. 1 fully meets the requirements. A pedestal type spittoon having all the essential functions of our superior spiral flush spittoon combined with modern sanitary construction.

The supply head comprises three faucets operated by finely constructed valves; a main stop valve located near the base; piping from the floor entirely concealed but with unions easily accessible.

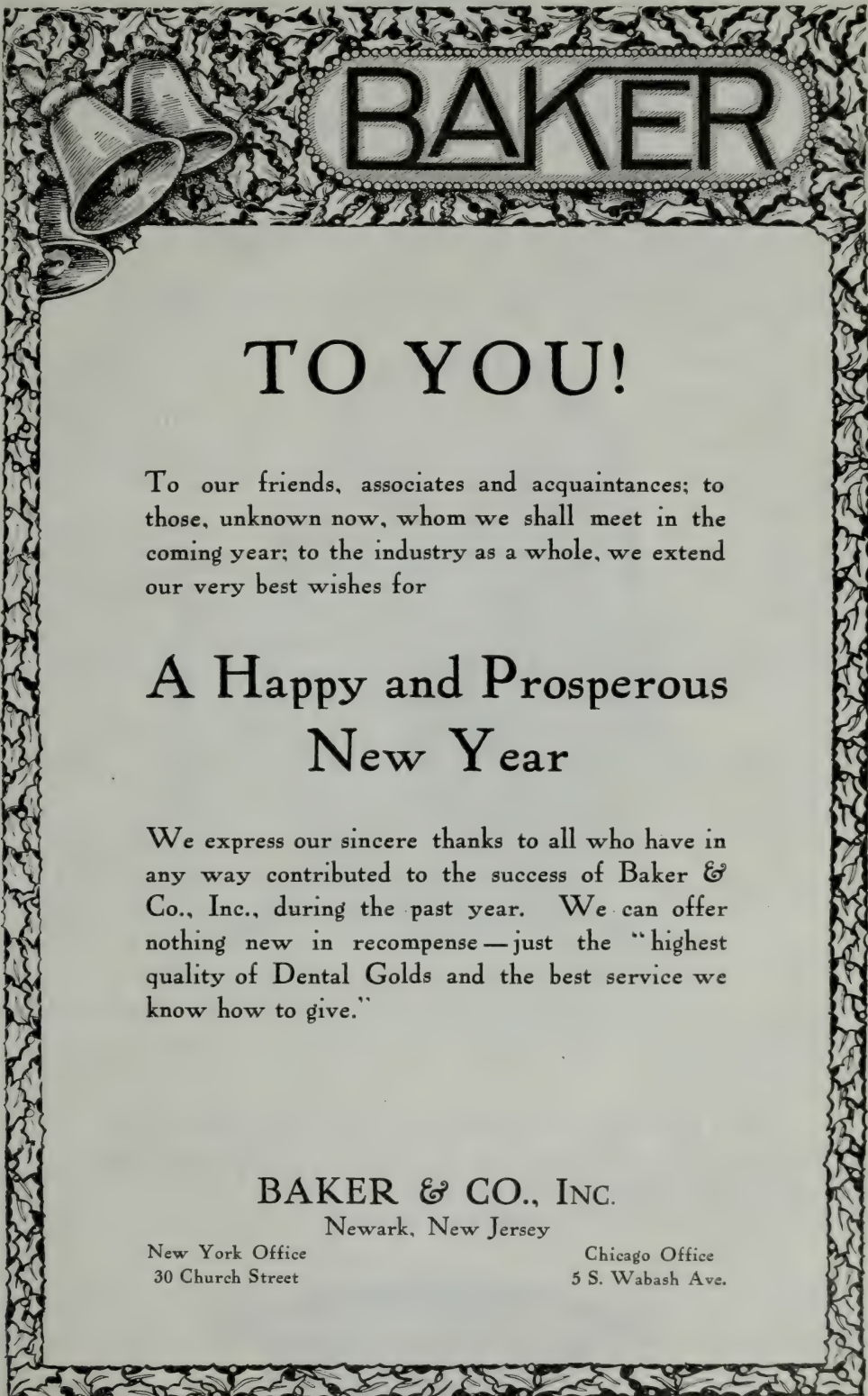
For sale by dental dealers

Ask for handsome catalog showing our complete line of "Modern Dental Equipment" now on press

The S. S. White Dental Mfg. Co.

"Since 1844 the Standard"

PHILADELPHIA



BAKER

TO YOU!

To our friends, associates and acquaintances; to those, unknown now, whom we shall meet in the coming year; to the industry as a whole, we extend our very best wishes for

A Happy and Prosperous New Year

We express our sincere thanks to all who have in any way contributed to the success of Baker & Co., Inc., during the past year. We can offer nothing new in recompense—just the “highest quality of Dental Golds and the best service we know how to give.”

BAKER & CO., INC.

Newark, New Jersey

New York Office
30 Church Street

Chicago Office
5 S. Wabash Ave.



The Mynol System of Charting Dental Operations

The chart shows at a glance the nature and extent of RESTORATION, ROOT CANAL FILLING, and MISSING TEETH.

Just the same as looking into the patient's mouth

Permanent restoration chart for each patient instead of the usual confusion of innumerable successive charts.

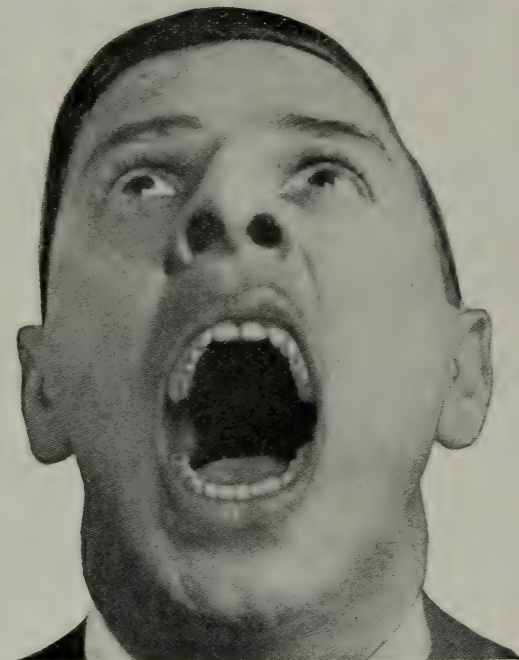
Separate chart for root canal filling and extraction.

Chart divided upper and lower, right and left.

Teeth numbered one to eight.

Restoration chart in yellow.

Root Canal Chart in black.



The value of CASE HISTORY IN DENTISTRY is recognized as essential to BETTER DENTISTRY.

Convinces the PATIENT that the dentist is particular and careful.

Protects the dentist against blackmail.

Provides a charge for every service rendered.

THE MYNOL POCKET ENVELOPE SYSTEM contains all these features.

THE MYNOL POCKET ENVELOPE SYSTEM

For the particular dentist who desires the complete record with detail of every operation. Everything pertaining to the patient kept in the envelope.

Embraces—ORAL DIAGNOSIS—CHARTING OPERATIONS—DETAIL OF OPERATIONS—ACCOUNTING.

THE MYNOL BUSINESS SYSTEM FOR DENTISTS

For the busy dentist who does not care for the recording of detailed operations.

Four-page sheet—first page PERMANENT RESTORATION and ROOT CANAL CHARTS—second, third and fourth pages ACCOUNTING.

CONTINUATION SHEET of four pages to be attached for continued accounting.

Order from your dealer



DE TREY'S SYNTHETIC PORCELAIN = = = = =

We know that DE TREY'S SYNTHETIC PORCELAIN is right by eleven years of the most rigid clinical and laboratory tests—

you know it is right by eleven years of daily practical use and by the presence of this seal on the package.



WE ARE BOTH CERTAIN

THE L.D. CAULK COMPANY

THE WORLD'S GREATEST
LABORATORIES
for the manufacture of
DENTAL FILLING
MATERIALS

DEPOTS
PITTSBURGH
HUNTINGTON, W. VA.
PHILADELPHIA, PENNA.

TORONTO
CANADA
MILFORD
DELAWARE



With Novol's Compliments

Regardless of what local anesthetic you may be using now—your own, ours or the other fellow's—we will be glad to send you a copy of "*Conduction and Infiltration Anesthesia*" without charge.

Anything that promotes or extends the proper use of local anesthetics—and this booklet certainly does it—will eventually react to the benefit of NOVOL, for some day you are going to try a bottle or a tube and when that happens—well, we won't have to worry about you any longer and you'll do less worrying about the safety of your anesthetic.

D. C. 12-19

NOVOCOL
CHEMICAL
MFG. CO., INC.,
2923 Atlantic Ave.,
Brooklyn, N. Y.

Gentlemen:

Kindly send me your book
"Conduction and Infiltration
Anesthesia."

Name

Street

City

**Novocol Chemical
Manufacturing
Company, Inc.**

2923 Atlantic Ave.
Brooklyn
N. Y.



PROPHYLACTIC TOOTH POWDER

ETHICAL. Because its ingredients are open to public inspection.

SCIENTIFIC. Because its production is the result of 37 years of continuous research, by Dr. M. L. Rhein in the field of preventive dentistry.

EFFECTIVE. Because its action is due to a mixture of an organic acid with alkaline agents, producing an impalpable powder, in which acid activity immediately removes the Mucin Plaque. This acidity is so quickly neutralized and altered into an alkaline reaction that all danger of enamel decalcification is avoided. In order to protect the public against worthless imitations and to afford dentists opportunity to prescribe a dentifrice in which each actual ingredient is known, Prophylactic Tooth Powder has been patented.



Prophylactic Tooth Powder will not only disclose the brilliant beauty of uncovered enamel, but it will keep all artificial dentures and appliances as clean and polished as they are when leaving the laboratory.

Any reputable dentist who has not received a sample can will have one mailed on request. There will be no general distribution of samples. A dentist's recommendation and prescription should suffice, with his patient.

PRICE

\$6 per dozen

\$66 per gross

A single can will be mailed to any address in the United States on receipt of 75 cents.

Patented United States
March 18, 1919

Patented Canada
August 12, 1919

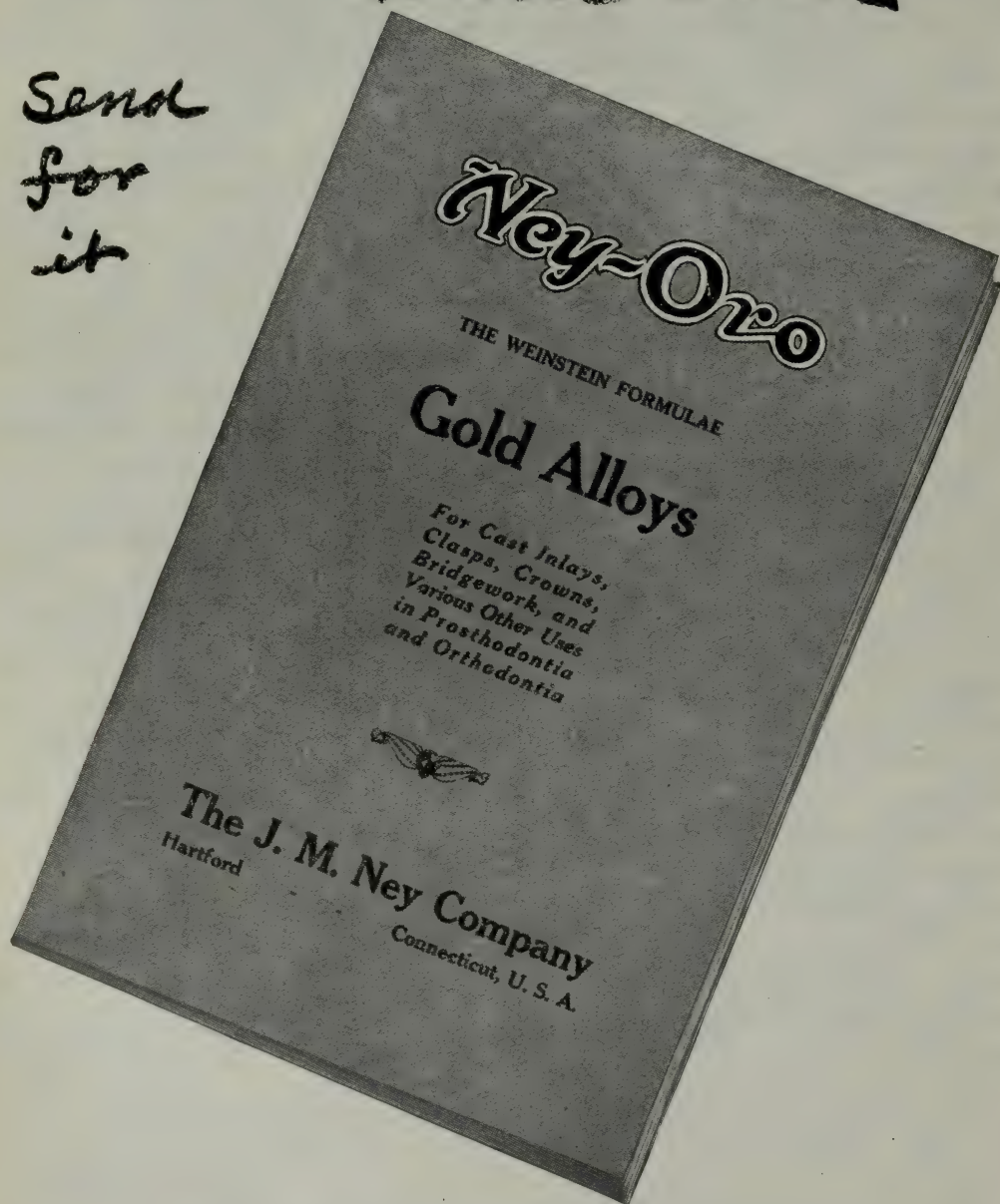
Prophylactic Tooth Powder, Inc.

38 EAST 61st STREET

NEW YORK CITY

You need this
little book

Send
for
it



LET'S GO

Some people
are worrying
about not
arriving
when the fact
is they have
never started

TIME
for starting
was never better

Dentists that
have started
with the
All Steel Dental
Cabinets
are there with
Praise for
the many merits
these beautiful
Cabinets possess

You will find
many features
to your liking



No. 510 Cabinet—Closed

Your dealer can furnish you with one of these
Cabinets without delay

Why not place your order TODAY?

The Columbus Aseptic Furniture Co.

142 N. 3rd Street

Columbus, Ohio

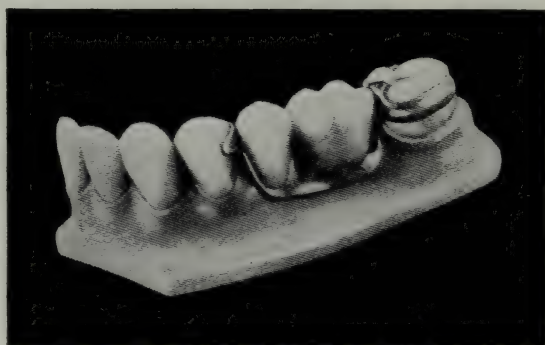
JULIUS ADERER, Inc.

CASTING GOLDS FOR DENTURES AND CLASPS

This Bridge and Clasp were cast from our
DENTURCAST and CASTCLASP

Trademark

Trademark



by an Expert Mechanic, but anyone understanding the basic principle of casting can do just as exact work with DENTURCAST for Plates, Saddles and Bridges and CASTCLASP for Clasps, manufactured and for sale by Julius Aderer, Inc.

Instructions and valuable hints in the use of our Denturcast and Castclasp with each package.

Put up in $\frac{1}{4}$, $\frac{1}{2}$, 1 and 5-ounce boxes

Price per dwt. for	DENTURCAST	.....	\$1.10
" " " "	No. 2 CASTCLASP	.....	1.65
" " " "	No. 1 CASTCLASP	.....	2.55

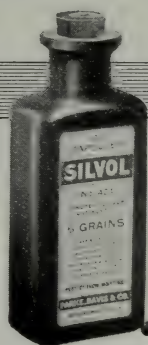
No. 1 CASTCLASP is an alloy of Platinum, Palladium, and Gold. The No. 2 CASTCLASP is a Platinum Gold Alloy; its fusing point is lower than the No. 1, but it is just as reliable.

JULIUS ADERER, Inc.

Manufacturers of Dental Golds and Solders

47 West 42nd Street

New York, N. Y.



Silvol

in Dental Practice

Contains
about
20 per cent.
of silver.

Highly
germicidal.

SILVOL, a colloidal proteid-silver combination, is being successfully used by dental practitioners in the treatment of pus cavities and infected tracts of the oral cavity. It is also employed in five- to ten-per-cent solutions for swabbing sockets after extraction.

A ten-per-cent solution of Silvol is being used in the treatment of pyorrhea. After instrumentation it is applied by means of a glass syringe equipped with a dental applicator. The pus pockets are first washed with warm water, dried, flooded with the solution of Silvol, and the latter allowed to remain for five minutes. The mouth is then rinsed with warm water. This treatment is repeated daily.

Silvol does not coagulate albumin. It will not stain enamel or hands if washed off after use.

SILVOL CAPSULES, 6 GRAINS.

The contents of one capsule added to two fluidrachms of water makes a five-per-cent solution of Silvol.

Supplied in bottles of 50 and 100.

Parke, Davis & Co.

DETROIT



Keep pace with the times

YOU have earned the confidence of your patients by consistent workmanship; but the surest way to keep that confidence is by putting the most efficient methods into your daily practice.

Photography's contribution to the science of dentistry is

Eastman Dental X-Ray Films

You can get them at any supply house.

EASTMAN KODAK COMPANY, ROCHESTER, N. Y.

CAST GOLD DENTURES

¶ We specialize in the casting of removable dentures, bridges, clasps, etc.

PERFECT RESULTS GUARANTEED

**Prosthetic Dentistry in
all its branches**

¶ Intelligent attention, modern equipment, present day ideas—the results of a perfect organization.

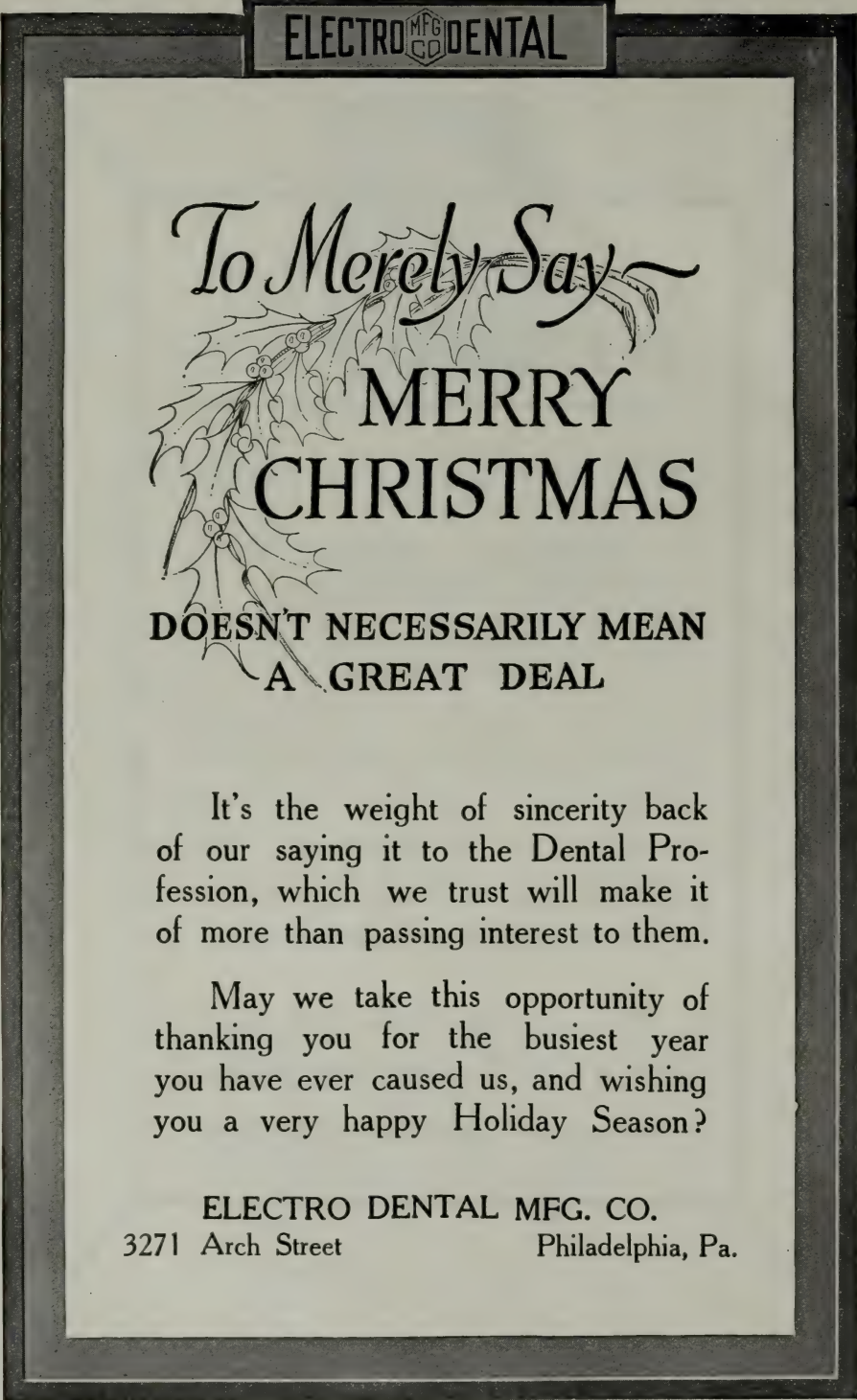
¶ Send models of your difficult cases. We will design most suitable appliance.

*Write for book of Beautiful
Colored Cuts*

Reese & Wiedhofft

180 N. Wabash Avenue
Chicago, Ill.

The World's Foremost Dental Laboratory



ELECTRO MFG CO DENTAL

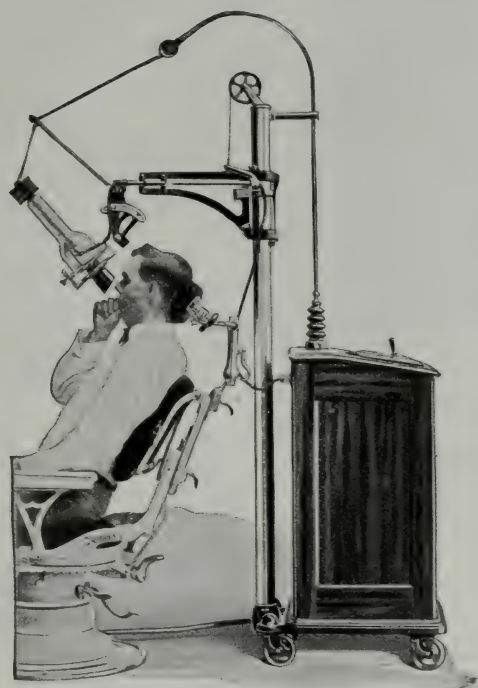
To Merely Say
**MERRY
CHRISTMAS**

**DOESN'T NECESSARILY MEAN
A GREAT DEAL**

It's the weight of sincerity back of our saying it to the Dental Profession, which we trust will make it of more than passing interest to them.

May we take this opportunity of thanking you for the busiest year you have ever caused us, and wishing you a very happy Holiday Season?

ELECTRO DENTAL MFG. CO.
3271 Arch Street Philadelphia, Pa.



A Dentist Need Never Apologize

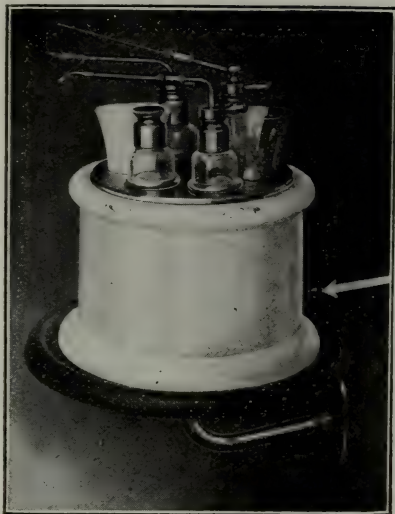
for his x-ray work, nor for the appearance
of his equipment if he has a "VICTOR"

Victor Service plus Victor Quality
vouch for this

VICTOR ELECTRIC CORPORATION

Dental Department

Jackson Blvd. and Robey, Chicago



The Bosworth Spray Heater and Bracket

"Spray Out Every Mouth"

The colored bulb in our Spray Heater will heat the spray bottles, and by diffusing a soft glow through the Opalite shell make the outfit very attractive.

The Bracket provides a definite place for the Heater, which can be installed in view of the patient and within easy access of Operator. Arrow points to shut-off switch.

In prophylaxis warm sprays are invaluable; the investment is small and the returns are big.

PRICES

Spray Heater, green or red bulb, with bottles and glasses with switch	\$18.00
Spray Heater, without bottles and glasses ..	14.50
Bracket, any finish	3.75

The Bosworth Bracket Operating Light No. 3 (Patented)

The consensus of opinion expressed by the users of the Bosworth Light is, that it is the most efficient from every standpoint of any light ever used or seen.

The construction of the Bosworth Light precludes the casting of shadows below or to the side. The rays of the 300 watt blue nitrogen bulb filtering through the lower and reflected from the upper shade (which is made of a special patented glass) produces an illumination that is 99% daylight.

Color matching is made possible and any kind of operations are materially assisted by the illumination provided, because of the brilliancy, penetration and even coloring of the rays.

The Bosworth Light is ornamental, practical and adjustable. Your light problem will be solved when you install a Bosworth Light. It will provide efficient illumination any place you desire to use it, and we have the fixture suitable to your needs.

Beware of imitations. Every overhead light is not a Bosworth. When you order a Bosworth be sure it has our name on. Many substitutions are made.

Price, black enamel	\$32.50
Mahogany, gray or white enamel, adds	2.50
Daylite Bulb adds	4.25
Boxing for shipment adds	1.50
Colored upper shade in mulberry, green, or blue to match color decorations, adds	3.50

HARRY J. BOSWORTH COMPANY

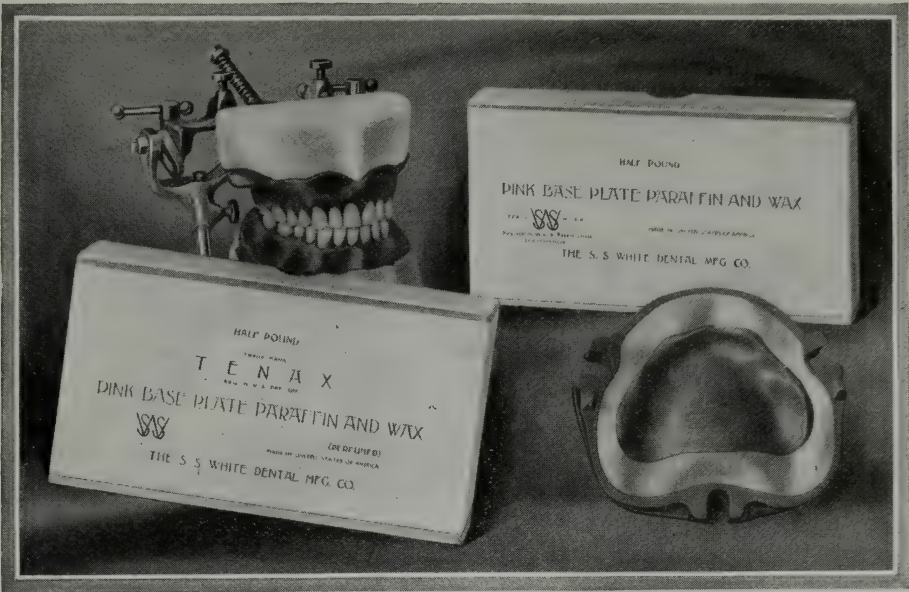
"Producers of Unique and Efficient Dental Needs"

Tower Building, Madison Street at Michigan Avenue

CHICAGO, ILLINOIS

Our Products Can be Obtained at all Good Dental Depots





S. S. White Pink Waxes

Pink Paraffin and Wax

Made to make base-plates.
It reproduces the intricacies of any surface; makes clean, sharp bites; carves readily, will not pull or drag under the spatula; holds the teeth firmly.
S. S. White Pink Paraffin and Wax is extremely hard and rigid, with remarkable toughness.

A base-plate made of it does not change its shape, and when removed from the mold it leaves no residue behind.

In sheets $2\frac{1}{8}$ x $5\frac{3}{8}$ in. Half-pound Box \$0.65

Tenax Wax

The extreme toughness of Tenax Wax permits it to be rolled into very thin sheets. The advantages of it are obvious for the making of thin vulcanite plates. Essentially it has the working character and all necessary qualities to make it of practical value aside from its thinness.

Made in sheets $2\frac{7}{8}$ x $5\frac{3}{8}$ in.

Thin Tenax Wax—No. 18 B and S Gage, Half-pound Box \$0.65

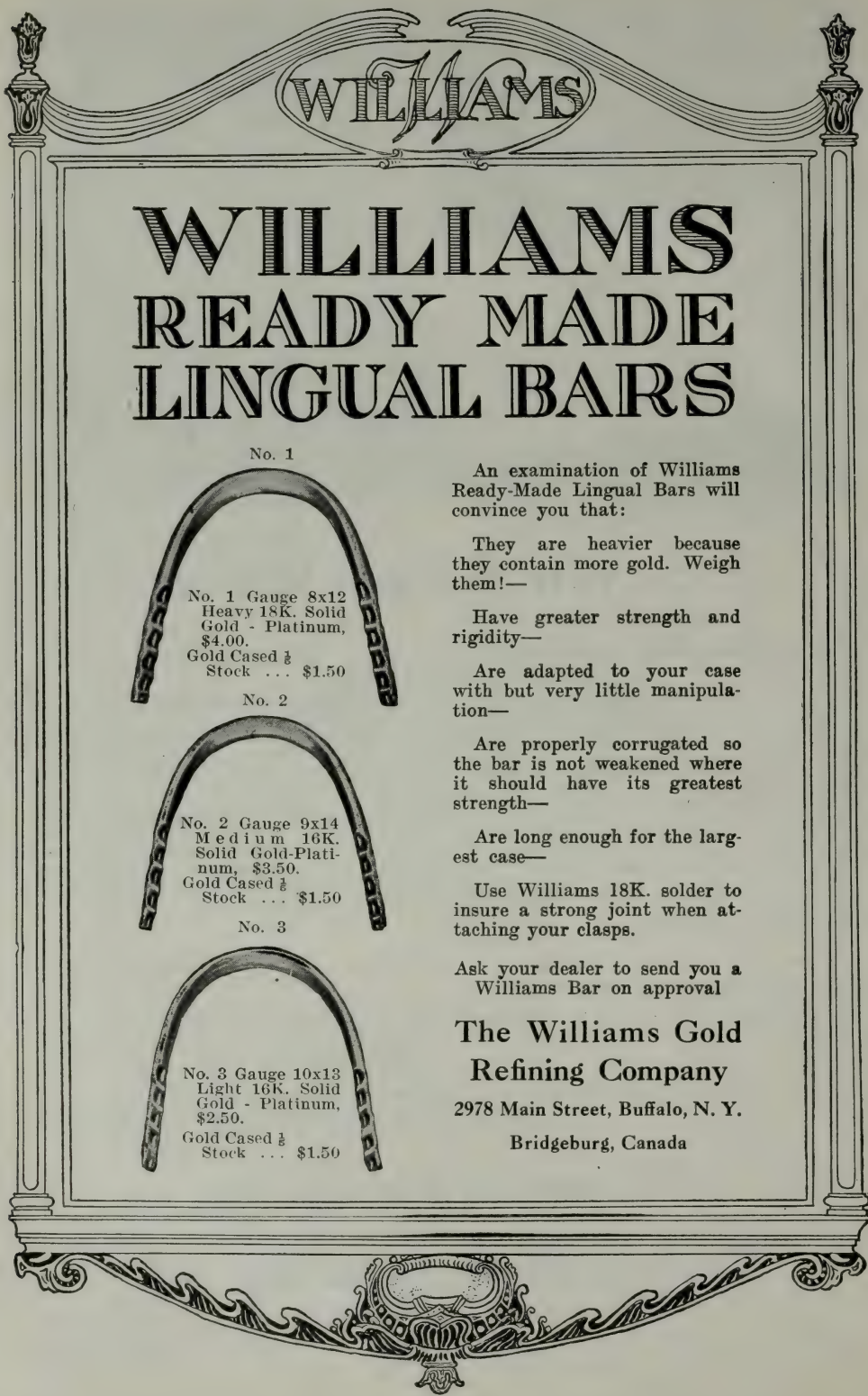
“Specially Thin” Tenax Wax No. 22 B and S Gage, Half-pound Box .75

Your Dealer Will Supply You

The S. S. White Dental Mfg. Co.

“Since 1844 the Standard”

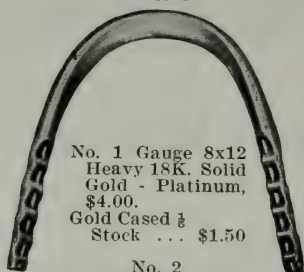
Philadelphia



WILLIAMS

WILLIAMS READY MADE LINGUAL BARS

No. 1



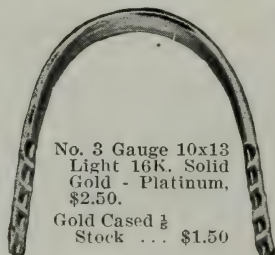
No. 1 Gauge 8x12
Heavy 18K. Solid
Gold - Platinum,
\$4.00.
Gold Cased $\frac{1}{2}$
Stock ... \$1.50

No. 2



No. 2 Gauge 9x14
Medium 16K.
Solid Gold-Plati-
num, \$3.50.
Gold Cased $\frac{1}{2}$
Stock ... \$1.50

No. 3



No. 3 Gauge 10x13
Light 16K. Solid
Gold - Platinum,
\$2.50.
Gold Cased $\frac{1}{2}$
Stock ... \$1.50

An examination of Williams Ready-Made Lingual Bars will convince you that:

They are heavier because they contain more gold. Weigh them!—

Have greater strength and rigidity—

Are adapted to your case with but very little manipulation—

Are properly corrugated so the bar is not weakened where it should have its greatest strength—

Are long enough for the largest case—

Use Williams 18K. solder to insure a strong joint when attaching your clasps.

Ask your dealer to send you a Williams Bar on approval

**The Williams Gold
Refining Company**

2978 Main Street, Buffalo, N. Y.

Bridgeburg, Canada



Professional Aspirations



RUBYTE Teeth have been the means of enabling many dentists to approach their aspirations as professional men. Dentures made with Trubyte Teeth stand apart from all others in naturalness, beauty and efficiency.

Whenever you are able to make your service and your work stand out above the average in your community, the advantage to you, as well as to your patients, needs no emphasis.

Trubyte Teeth supplement your skill because they add the science of tooth form—
artistically applied

Order them from your dealer or direct

TRUBYTE plain vulcanite gold-clad pin teeth; combination sets having diatoric posteriors; Facings with flat pins, Crowns with detached posts may be obtained from nearly all American dealers; in Europe, Great Britain and the British Colonies they are known as Anatoform teeth and are supplied also in the form of flatbacks with headed pins, for vulcanite plates.

THE DENTISTS' SUPPLY

SOLE MANUFACTURERS

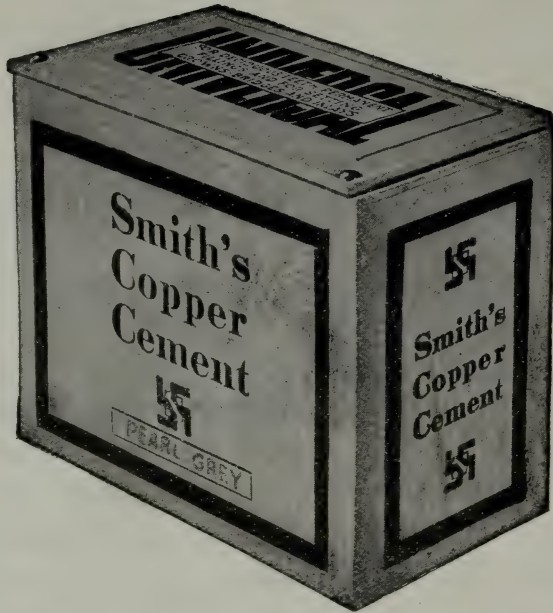
220 WEST 42ND ST.



COMPANY OF NEW YORK

OF TRUBYTE TEETH

NEW YORK



DEPEND UPON IT

**A crown set with it can't come off.
Bacteria with which it comes in con-
tact are destroyed. And it WILL
NOT DISCOLOR IN THE MOUTH.
What more could you ask of any zinc
cement?**

**What more could you ask of any ger-
micial cement?**

**Smith's Copper Cement is both a zinc
cement and a germicial cement.**

S. S. White Forceps

THE difference between thoroughly well made forceps and those of careless manufacture classifies them as satisfactory, in the first case, and unfit for use in the other.

Take the forceps illustrated, for example. Delicacy in contour of the beaks, their sharp and slender points must be accompanied by unfailing strength. The extreme points must be hard without sacrificing the elasticity of the steel. Powerful handles shaped to the comfort and strength of the hand must operate the beaks without binding or lost motion in the joint. No detail can be slighted.

Notwithstanding the use of machinery wherever possible, these fine forceps require a vast amount of highly skilled hand labor to give them the superior qualities for which they have long been noted.

Our tribute to the dentists is that our efforts have been appreciated.

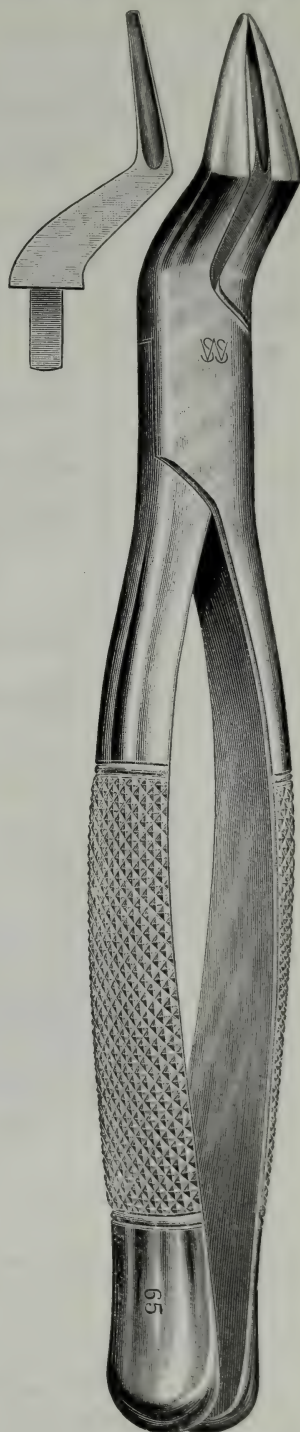
Your Dealer Will Supply You

The S. S. White Dental Mfg. Co.

"Since 1844 the Standard"

Philadelphia

(Send for complete catalog of S. S. White Forceps)



No. 65

Upper Root Forceps

**Spyco
Re-distilled
Mercury
\$3.00
per
Pound**

**Send
Shipment of
Scrap Gold
Platinum
Amalgam
Sweepings, etc., to
Spyco
Smelting & Refining Co.
for
Satisfactory and
Speedy returns**

**Full
Allowance
Made
for
Platinum
Contents**



Scrap gold, filings and grindings refined into plate, solders and clasp material, or returns in cash if desired

Spyco Smelting & Refining Co.

General Office

3rd Floor, Syndicate Building

Works

526-528 South Fifth Street

MINNEAPOLIS, MINN.

AUTO-FLUX

TRADE MARK

(PATENTED)

AUTO-FLUX Solder Strips are corrugated to receive and retain a charge of borax calculated to be exactly sufficient to do the work of fluxing in soldering.

AUTO-FLUX Strips enable you to solder more quickly, more safely, more efficiently. They cost no more than ordinary solders. Packed in two-pennyweight envelopes and one-ounce boxes.

Ready-Shaped LINGUAL BARS

Made in three grades of solid gold and gold-and-platinum clasp, and three grades of gold-cased wire.

Bars are carefully made from specially designed oval wire and shaped to offer the least obstruction to the tongue.

Send for illustrated circular with price list.

SPLIT PIN and TUBE

Our Split Pins with Tubes are made in two sizes approximating gauges 13 and 14.

Tubes are of platinum; split pins of a special platinum-gold alloy designed to reduce wear to a minimum.

Prices:

Small \$5.50

Large 6.00

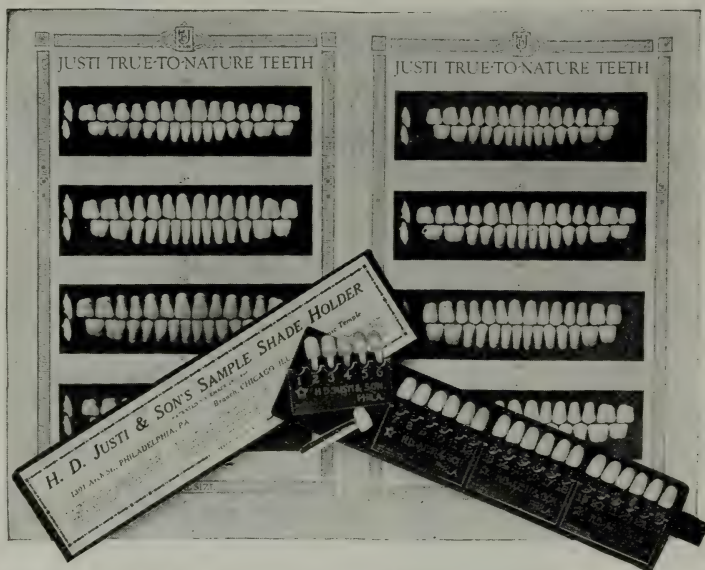
SUBJECT TO CHANGE WITHOUT NOTICE

I. STERN & CO.

MANUFACTURERS OF

DENTAL GOLD SPECIALTIES—GOLD, PLATINUM AND SILVER REFINERS
104-106 West 116th Street New York City

HAVE YOU A *JUSTI* SHADE GUIDE AND TOOTH CATALOG?



TO OBTAIN THE BEST RESULTS IN
SELECTING *JUSTI* TEETH FOR YOUR
CASES, YOU SHOULD HAVE BOTH.

THEY SAY MORE NATURAL TEETH CAN BE
MATCHED WITH *JUSTI* SHADES THAN WITH
ANY OTHER SHADE GUIDE. TRY IT YOURSELF.

ALL TEETH IN CATALOG ARE ACTUAL SIZE. A REQUEST
TO EITHER YOUR DEALER OR DIRECT WILL BRING YOU
ONE OR BOTH GRATIS.

H. D. JUSTI & SON

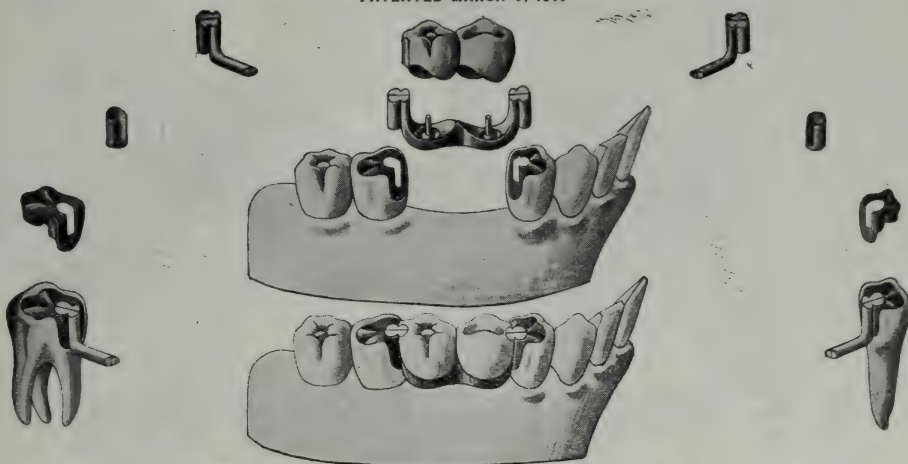
PHILADELPHIA



CHICAGO-

JOHN YIRIKIAN, Inventor and Manufacturer of
New Split Attachment for Removable Bridge Work

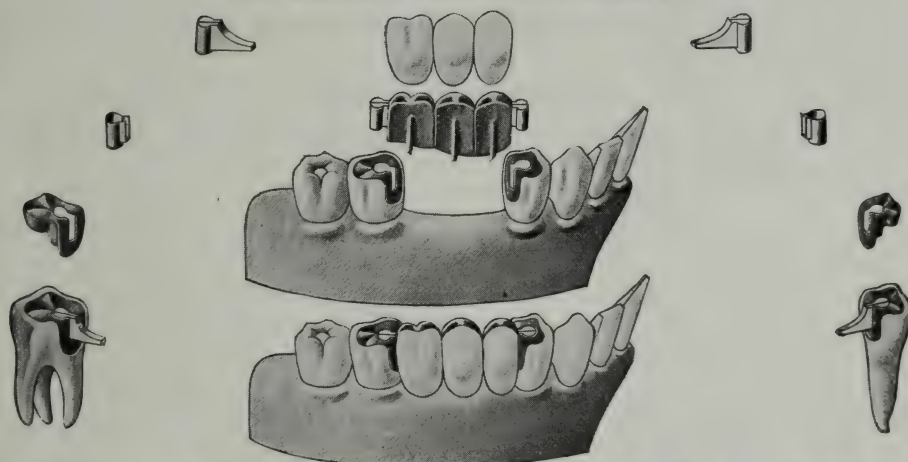
PATENTED MARCH 6, 1917



- A. \$7 B. \$8 C. \$9 D. \$9 E. \$9 F. \$9

The entire attachment is made of 20 per cent. Iridio-platinum, is very strong

Using Live Teeth for your Abutments
YIRIKIAN ATTACHMENT



1. \$7 2. \$8 3. \$9 4. \$9 5. \$9 6. \$9

Try Yirikian's Famous inlay casting wax. \$2 per box.

JOHN YIRIKIAN, 391 Central Park West, NEW YORK



S. S. White Buff Rubber Dam

"Pleases Its Users"

There is an irresistible appeal in the fine color and beautiful surface of Buff Rubber Dam. The texture confirms your first impression.

It is tough and lively, and never has the frosty appearance sometimes called "bloom." Punch clean holes and you can stretch them without fear of tearing the dam.

The color makes Buff Rubber Dam a light reflector and it adds that much in the illumination of the teeth it protects.

In Rolls or Cut Sheets

Rolls, 5 inches wide, in Cartons

Thin Half Yard, \$0.65; Yard, \$1.25

Medium . . . Half Yard, 0.90; Yard, 1.75

(Always 1,296 square inches to the yard)

Cut Sheets in Sealed Packages

Thin, 20 sheets (5 x 6 ins.) per package, \$0.90

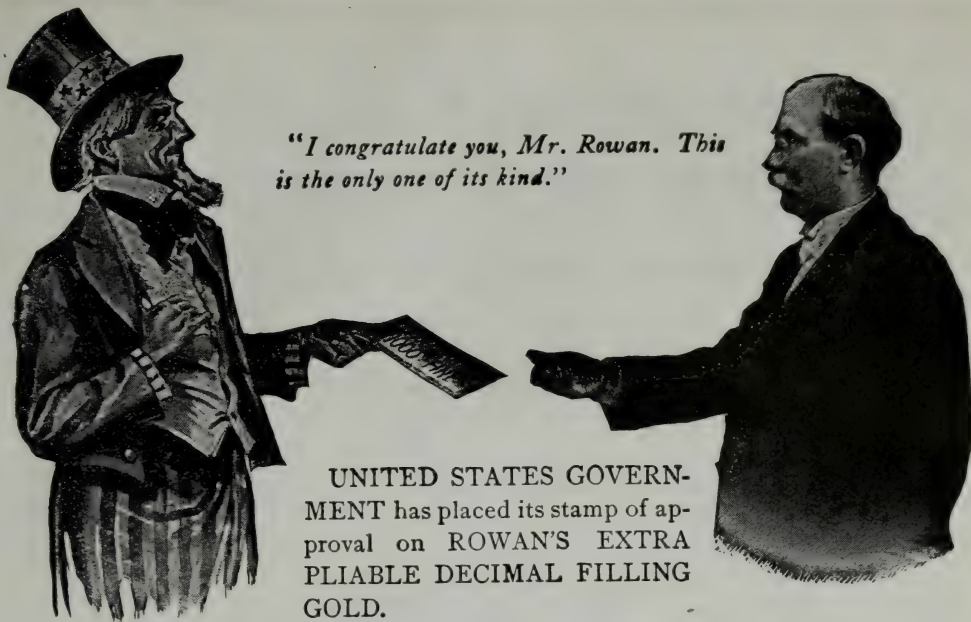
Medium, 20 sheets (5 x 6 ins.) per package, 1.15

Your Dealer Will Supply You

The S. S. White Dental Mfg. Co.

"Since 1844 the Standard"

Philadelphia



Rowan's Extra Pliable Gold is the Very Finest and Purest Filling Material That Dentists Can Obtain.

The accompanying illustration shows the result of a United States photographic Government Assay of a sample of Rowan's Extra Pliable Gold, being a reduced photographic facsimile of the original assay slip now in our possession.

All other Rowan's preparations are made with equal care and skill, and dentists who use them can confidentially assure themselves and their customers of uniformly satisfactory results.

Particular attention is invited to *Rowan's Decimal Gold Plates and Solders*. Our gold plates and gold solders are of such superior working quality, and finish, that dentists ought to know the golds intimately and procure same from their local dealer.

Trade Mark

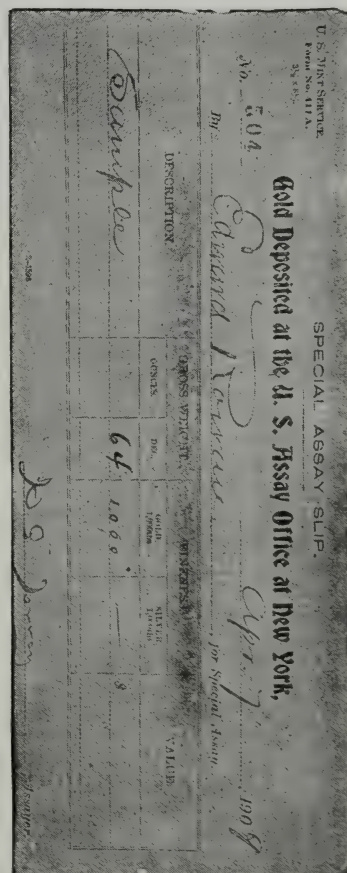


EDWARD ROWAN

INCORPORATED

625 East 163d St.

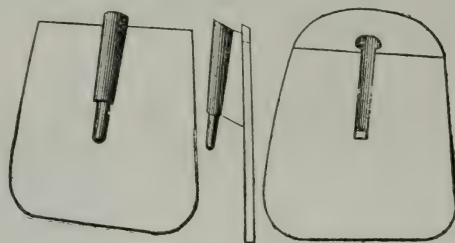
NEW YORK



Points of Prominence Peculiar to the Ideal Tooth

The slot in the Ideal Tooth is continued by a counter-bore, of reduced diameter, which creates a solid wall of porcelain *behind the pin*.

This reduction in diameter produces a shoulder which prevents the pin from forcing itself beyond the proper point and protects the facing against the end-to-end bite. It will be seen,



by an examination of the cuts, how the facing is securely anchored to its backing and is insured against being torn away.

Ideal backings are made of *one piece* of metal. There are no seams and no solder. You can heat in the open flame, therefore, without fear. Being seamless, there is no danger of leakage of solder through to its front face. Further; the pin being solid, there is no hollow space to act as a culture tube for bacteria.

The Ideal Tooth is the *only* facing that can be tipped to any extent and still retain its interchangeable feature. The pin is inclined at an angle of 4° . In slipping into place, this inclination, together with the fact that the reduced pin enters the larger slot first, allows sufficient tilting for the facing to pass the tipped incisal edge of the backing, before settling into place.

Write for booklet.

Consolidated  **Dental Mfg. Co.**

130 Washington Place

New York

Test This Mouth Wash

*and satisfy yourself that you should recommend
McK & R Milk of Magnesia in preference to all others*

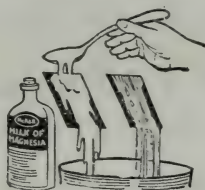
First Test



Consistency

Shake the bottle thoroughly; then pour into left palm a spoonful of McK & R Milk of Magnesia. Into right palm pour spoonful of any competing brand. **Result:** McK & R Milk of Magnesia stands up and does not run easily off the hand. Competing brands are more watery, and will follow crease of the palm, running off on the floor. McK & R Milk of Magnesia is to other brands as cream to milk.

Second Test



Whiteness

On a piece of black or dark colored paper pour spoonful of McK & R Milk of Magnesia and on the same piece of paper pour a spoonful of competing brand. **Result:** McK & R Milk of Magnesia shows up clearly several degrees whiter. It is purer, cleaner, and the manufacturing process is more complete.

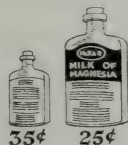
Third Test



Ingredients

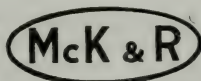
Examine the labels of McK & R Milk of Magnesia as compared to other brands. The McK & R product contains 35 to 40 grains of Magnesium Hydroxide to the fluid ounce. Other brands vary from 16 to 32; most of them but 26 grains to the fluid ounce. **Result:** McK & R Milk of Magnesia is very much superior to the requirements of the U. S. Pharmacopeia.

Fourth Test



Quantity

Your patient receives eight ounces of McK & R Milk of Magnesia for 25c at the drug store. Of several other brands she receives but four ounces for 35c, and of others, six ounces for 25c. **Result:** Satisfaction to yourself and to your patient.



Fifth Test



Reputation

Behind the McK & R Milk of Magnesia are 86 years of scientific laboratory experience. Our oval trademark is a pledge of excellence of formula, purity of ingredients and quality of manufacturing process. **Result:** Increased prestige for you.

If you will make these tests, you will see why it is to your advantage to recommend and advise McK & R Milk of Magnesia as a mouth wash for every patient

The Kesson & Robbins, Inc.
Manufacturing Chemists

91 FULTON STREET

NEW YORK CITY

Did You Receive Your Copy

Now Ready for Distribution

"OUR BOOK"—"CERAMIC DENTISTRY"

A treatise on the practical application of Porcelain Art in Dentistry.

"OUR PAMPHLET"

A Dentists' Experience With His First Porcelain Jacket Crown.

BOTH HIGHLY INTERESTING AND INSTRUCTIVE

The following letter from a dentist who sent impressions of his first case:

"Gentlemen:

Am very greatly interested in the Porcelain Jacket Crown, and have sent by separate mail, impressions for my first case, shade 36—S. S. White.

I am not perfectly sure about the requirements for this class of work but hope the impressions sent will enable you to complete the Crown.

Very truly yours,"

The impressions were impractical to proceed with. We sent him our literature and letter of instructions and his second attempt resulted in perfect impressions. We completed the Jacket Crown. Here is copy of his letter. It is typical of many received at these laboratories.

"Gentlemen:

The Porcelain Jacket Crown received and cemented into position. It is a very beautiful piece of work; my patient is delighted and so am I. My experience with this, my first case, convinces me that the Porcelain Jacket is a masterpiece in dental restitution, and I shall immediately proceed with other cases.

I want to thank you for your efforts in my behalf, and for your courteous patience in assisting me to a correct understanding of the requirements for the Porcelain Jacket Crown.

Yours very truly,"

Our duty is to serve the profession.

Our experience qualifies us to give practical assistance.

Our very large experience enables us to produce perfect results.

Our literature and assistance is at the command of any practitioner, and is free.

The Lochhead Laboratories, Inc.

Specialists in Ceramic Dentistry

BOSTON

CHICAGO

NEW YORK

Watch the Teeth

Cleaned With Pepsodent

You will meet them constantly, for millions of teeth are now cleaned with it.

Note how Pepsodent reduces the tartar formation—how it combats the plaque.

The use of Pepsodent means this:

The daily application of activated pepsin to the protein plaque—particularly in the interstices.

Efficient daily polishing with tricalcic phosphate, the chief

tooth constituent. It is uniquely effective, yet the most exhaustive tests prove it harmless.

An alkaline mouth condition. Pepsodent is acid in reaction. It contains no soap or other alkali. Therefore it stimulates the flow of alkaline saliva.

Every dentist who tests it or watches the results will approve it and urge its general adoption.

Ask us for a tube to try.

Pepsodent PAT. OFF.
REG. U. S.

Dental Mucin Digestant

Based on activated pepsin.

Contains no soap, no chalk

248

THE PEPSODENT COMPANY,
5105 Ludington Bldg., Chicago, Ill.

Please send me, free of charge,
one regular 50c size tube of Pepsodent,
also literature and formula.

Name

Address

Enclose card or letterhead

Make Your Precious Metal Scrap Profitable

by sending to us gold clippings, old bridges, inlays, platinum clippings, or any scrap containing precious metals, for cash or to be exchanged for Precious Metals, Teeth or Merchandise.

We refine mixed scrap, and pay full assay value, less refining charges, for Platinum, Gold and Silver Content.

A satisfactory transaction is always assured when dealing with

THE S. S. WHITE DENTAL MFG. CO.

"Since 1844 the Standard"

PHILADELPHIA

NEW YORK

ATLANTA

BOSTON

CHICAGO
SAN FRANCISCO

BROOKLYN

OAKLAND

Dr. Scheuer's Tricresol Formalin Paste and Solution

A permanent, reliable, germicidal stopping whose rapid healing and antiseptic powers are invaluable in the treatment of

Pulp Decomposition

In this treatment the dentist will invariably meet the following cases:

1. **Gangrene in Teeth Not Showing Inflammation:** After removing the putrescent mass from the pulp-canal, insert a piece of cotton with Tricresol Formalin solution into the pulp-chamber and allow to remain there from 24 to 48 hours. One or two treatments are sufficient to prepare the canal for permanent closing. Final removal of the decayed parts and the introduction of Scheuer's Tricresol Formalin Paste forms a permanent germicidal stopping and the filling of the tooth can be finished.
2. **Severe Periostitis:** First remove all pus. Then proceed as in Case 1.
3. **Gangrene in Tooth with Fistula:** Open the tooth, clean, insert a piece of cotton with Tricresol Formalin solution and seal hermetically. A few treatments and the insertion of Scheuer's Tricresol Formalin Paste will invariably lead to permanent recovery.

Write for full directions, free on request

PRICES

Complete Box—Paste and Solution \$2.00

Separate:

1 Bottle Dr. Scheuer's Tricresol Formalin Paste \$1.50

1 Bottle Dr. Scheuer's Tricresol Formalin Solution 50

Gustav Scharmann

1183 Broadway

New York

The Test of Time

has stamped the

ADAMS DENTAL X-RAY UNIT

With Coolidge Automatic Tube

First in simplicity of operation.

First in practical value to the Dentist.

First in durability.

First in perfection of detail.

First in point of production.

First in the praise of 600 users.

Your dealer can make **Immediate Delivery** and
guarantee the operation of this unit
to your satisfaction

Will your next X-Ray Machine last as long as
your chair? Read "The Adams Unit in Service."
Write for copy, or ask your dealer.

Adams X-Ray Company

10 Seward Ave.

Detroit, Mich.

LISTERINE

offers a definite, dependable service to the Dental Surgeon in his operative work. The care exercised in the manufacture of Listerine insures a uniformity in preparation which may be relied upon to produce like results under like conditions.

LISTERINE

has an agreeable, refreshing taste, and this, combined with its well-proven antiseptic properties, makes it a most acceptable solution for use as a spray or wash prior to and after operations on the teeth or gums.

LISTERINE

possesses a two-fold antiseptic effect. After evaporation, a film, consisting of boric and benzoic acid, with baptisia tinctoria remains on the surface to which Listerine has been applied.

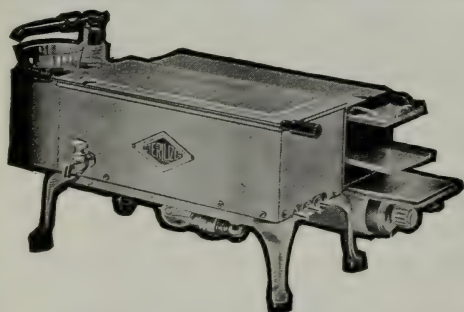
A small quantity of Listerine evaporated from a watch glass, or other suitable container, will disclose a residue of these beautiful crystals in abundance, as Listerine is a saturated solution of boric acid.

May we send a bottle of Listerine to your address, Doctor, for your observation and use?

Lambert Pharmacal Company

2101 Locust Street

St. Louis, Mo., U. S. A.



THE HALVERSON SAFETY FUSE SCREW

which automatically separates when the water is exhausted and prevents damage to sterilizer and contents.

*"A new fuse screw is easily inserted
in a few seconds"*

Tumblers are furnished but not the spray bottle.

The Simplicity of automatic tray lift.

The Tumbler and spray warmer attachment.

The Sanitary smooth bottom.

The Dry Unit for dry sterilization.

The few number of parts in our heating element, due to knowledge gained by time and practical experience, are only a few of the many superior features of the Halverson Sterilizer.

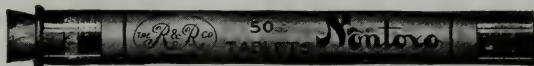
Send for illustrated circular of different sizes and models

THE HALVERSON COMPANY

180 N. Dearborn Street
Chicago, Ill., U. S. A.

Union Ave. at East Oak St.
Portland, Ore., U. S. A.

Nontoxo in Tablet Form



FORMULA:

Novocain (Procaïn) 0.02 Gram
 Suprarenin (Synthetic) 0.0005 Gram
 Dissolve in 16 minims normal salt solution

A Convenient Form for Preparing *Nontoxo* Solution
 (The Anesthetic Without Cocain)

Now prepared from American Ingredients only, and
 available in reasonable quantities

Price, per vial of
 50 Tablets, \$1.25
 12 Vials . 13.50

The Ransom & Randolph Co.
 Toledo, O., U. S. A.

Your Dealer

Your Dealer Has It He Appreciates QUALITY

Novocain (Procaine-Metz) Powder

for anaesthetic solutions and as a wound dressing

Novocain-Suprarenin ("N-S") Tablets "E" and "T"

for infiltration and conduction anesthesia

Novocain-Suprarenin ("N-S") Pluglets

for pressure anesthesia

H. A. METZ LABORATORIES, Inc.

122 Hudson Street

New York City, N. Y.



S. S. White Modelling Composition

Is Dependable

- ☐ Is fine-grained, can be made perfectly plastic by heat, and hardens promptly.
- ☐ Takes a sharp impression of the most intricate subject, retains its shape and size and fullness of detail in cooling.
- ☐ Is free from brittleness, won't break if you let it fall.

In half-pound boxes, \$0.50

Your Dealer Will Supply You

The S. S. White Dental Mfg. Co.

"Since 1844 the Standard"

Philadelphia

GOLD SHELLS

Nelms manufacture thirty different sizes of gold shells and five lengths of each size.

The shells are uniform in size, the even or odd numbers will telescope the next even or odd number, the best for removable bridge work.

Shells are cut $1/4$ ", $5/16$ ", $3/8$ ", $7/16$ ", and $1/2$ " in length, annealed, polished, and numbered ready for use. None better.

Write for chart and price-list

Established 1842

HENRY NELMS & SON

Manufacturers of Dental Golds

46 and 48 N. 7th ST.

PHILADELPHIA, PA.

FIRST and LAST EACH CEMENTATION KINDLES SATISFACTION



MANUFACTURED BY
THE STANLEY CHEMICAL CO.
NEW YORK

S. S. White Gold Clasp Metals *Tough, Springy, Non-Corrodible*

For Cast or Soldered Work

Clasp Metal No. 1. A gold-platinum alloy of the highest character, accepted for years as standard in all applications including cast gold work.

Plate, per dwt. - \$2.40
Wire, per dwt. - 2.45

For Soldered Work

Clasp Metal No. 3. A high-grade gold alloy without platinum, of a fine color, and with every characteristic of a fine clasp metal except that it is not adaptable for cast gold work.

Plate, per dwt. - \$1.35
Wire, per dwt. - 1.40

Both metals retain their springiness after being red-hot

Your Dealer Will Supply You

The S. S. White Dental Manufacturing Company
"Since 1844 the Standard"
PHILADELPHIA



The Educator Company

Will mail free to any dentist in the world one tube of

Chlorodone

for the treatment of

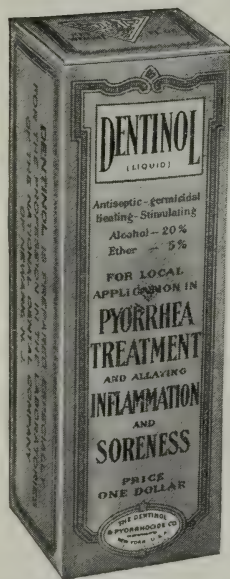
Pyorrhea

Chlorodone Paste has been developed with the one idea in mind to act in the treatment of Pyorrhea and oral lesions in the same wonderful way that Dichloramine-T and Dakin's solution acted in war surgery.

Literature and sample sent on request

The Educator Company

Sta. A. Middle City Bldg.
Philadelphia, U. S. A.



TOXICITY

The treatise on toxicity showing comparative tests of Dentinol and Iodine as presented in "Causes and Effects of Pyorrhea" will interest every member of the dental profession whether he is or is not specializing in pyorrhea work.

The efficiency of remedial agents designed for pyorrhea treatment must be determined by their ability to destroy the germs lining a pyorrhea pocket without destroying the soft or hard tissues.

DENTINOL is non-poisonous. It contains Cresol, Oils of Birch, Capsicum, Eucalyptus, Sassafras and Turpentine—Alcohol and Ether. Its healing, antiseptic and germicidal properties are appreciated by all users of it.

DENTINOL, being non-destructive to oral tissue, is *always applied full strength* in pyorrhea treatment, or in allaying soreness and inflammation caused by extractions, the placing of bridges, crowns, clamps or ligatures.

FREE

A trial bottle of DENTINOL, for office treatment, samples of PYORRHOCIDE POWDER for distribution to pyorrhea patients, and a copy of "Causes and Effects of Pyorrhea" mailed on request.

The Dentinol and Pyorrhocide Co., Inc.

1480 BROADWAY

NEW YORK

The small mound-shaped elevation in the center of the mortar keeps the alloy and mercury continually under the pestle, thus producing quicker and more thorough amalgamation.

NO user of Amalgam can afford to be without this handy aid to mixing.

S. S. White Mortar and Pestle No. 8

Price \$0.75

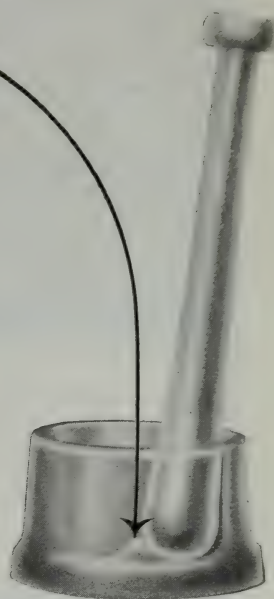
Price subject to change without notice

Your Dealer Will Supply You

The S. S. White Dental Mfg. Co.

"Since 1844 the Standard"

Philadelphia



Clover Leaf Dental Plaster

Solves both ends of the Plaster problem.

Takes minutely accurate impressions of the smallest details quickly.

Gives hard, firm models that reproduce the accuracy of the impressions.

Expansion—contraction negligible—no distortion in setting.

Breaks with a sharp, clean fracture—no crumbling.

Put it to the test; mail the attached coupon and get a liberal trial package of both kinds, XX Quick-Setting for impressions, X Standard Set for models.

For Sale by Dental Dealers

H. B. Wiggin's Sons Co.

Manufacturers

Bloomfield, N. J.

Western Office

160 JACKSON BLVD.

CHICAGO, ILL.

H. B. Wiggin's Sons Co.
Bloomfield, N. J.
Gentlemen:
Please send
Plaster.

me samples of Clover Leaf Dental
Dr.
Address
D. C.

**THE
ORIGINAL
ZINC CHLORIDE
ANTISEPTIC
—
AN ETHICAL
FORMULA OF
PROVEN MERIT.**



LAVORIS
TRADE MARK

**AS A
GUARD AGAINST
CONTAGIOUS DISEASES**

FORMULA
EACH PINT CONTAINS

ZINC CHLORIDE	 1.040
MENTHOL	 0.400
SACCHARIN	 0.195
FORMALIN	 0.195
OL. CASSIA ZEYL.	... 0.700
OL. CARYOPHYL	... 0.195

NO ACID USED



We Claim BREWSTER ALLOY

has

No Shrinkage or Expansion

and that it retains its bright color in the mouth to a remarkable degree.

Dentists in all parts of the country are proving these claims to their own satisfaction.

Space does not permit our publishing the many complimentary letters we are receiving, but *Doctor you can prove all our assertions* for yourself by a trial backed by our guarantee of money back if not thoroughly satisfied.

Manufactured solely by

E. R. S. BREWSTER

Gold, Silver and Platinum Refiners

159 N. State Street

CHICAGO, ILL.

Works, 2732 High Street

Nothing is Better to Keep the Mouth Clean than

Dioxogen

It combines mechanical cleansing with chemical sterilization.

This double action produces a high degree of cleanliness and as near complete sterilization as is obtainable in the mouth. It is valuable in specific as well as routine treatment.

THE OAKLAND CHEMICAL CO.

10 ASTOR PLACE

NEW YORK

TRAUN'S "IDEAL"
DENTAL RUBBER

TRAUN'S
"GOLDDUST"
DENTAL RUBBER
for
Dental Bases

TRAUN'S
"MAIDEN BLUSH"
PINK
DENTAL RUBBER
FOR
Facing

TRAUN'S
RUBBER DAM
"IDEAL"
"CRÈME COLOR"
"ILLUMINATED"
"PERFUMIZED"

MANUFACTURED BY

TRAUN RUBBER CO.
ATLANTIC RUBBER MFG. CORP.

SALES AGENTS

239-243 4TH AVE.

NEW YORK, U.S.A.



For Patients Whose Digestion is Upset

Borden's Malted Milk offers a concentrated, partially predigested food that is peculiarly appropriate for patients suffering digestive reaction following exhaustive dental treatment.

It is partially predigested by an improved, exclusive process whereby malt ferments acting on the proteins of milk and cereals convert them to partial peptones—favoring easy, complete digestion and assimilation with minimum tax on the gastro-intestinal tract.

Borden's Malted Milk is a pleasantly palatable, strength-sustaining, nourishing food that's eminently suitable when digestion is upset or when tender, lacerated gums forbid proper mastication and demand a satisfying and sustaining light diet.

Samples, analysis and literature on request.

Borden's Condensed Milk Co.

Established 1857

Borden Building

New York

Borden's
THE IMPROVED
MALTED MILK

Official Committees and Professors of Colleges by the score, and Independent Practitioners by the thousand, all around the world in thirty-odd years have demonstrated that the

Eckfeldt & Du Bois Standard Alloy

constitutes a class by itself as truly now as it did when it first issued as a new departure and stood for a new order of things. It was and is made upon basal conceptions, and by a process original with the house whose firm name to the fourth generation has stood for unique achievement in the chemistry, metallurgy and mechanics of the precious metals and their alloys.

We do not find the word "Standard" in dental advertising prior to our adoption of it. It is frequently used now. The Standard Alloy has given the word itself such value that it is a commercial asset. So, beware of piracy and substitution. Get the original and only genuine, made by

Eckfeldt & Du Bois

1314 Arch Street, Philadelphia, Pa., U. S. A.

BUY

MIRRORS

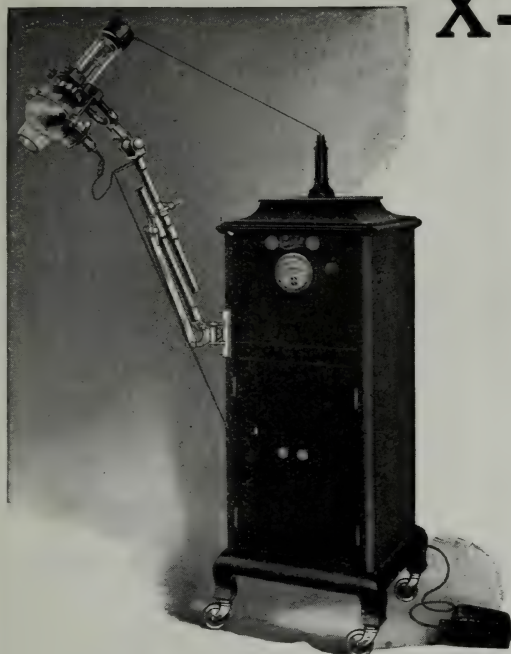
Made by

Specialty Mfg. Co.

Dental Specialties

15 Spruce St., New York

X-RAY



**SIMPLE
SILENT
SURE**

**Campbell
Coolidge**
DENTAL X-RAY
UNIT

The Result
of Years
of Combined
Research Work

Sold by
Reliable Dealers
Supported by
Factory Service

Campbell Electric Co., Lynn, Mass.

SEND COUPON FOR CATALOG

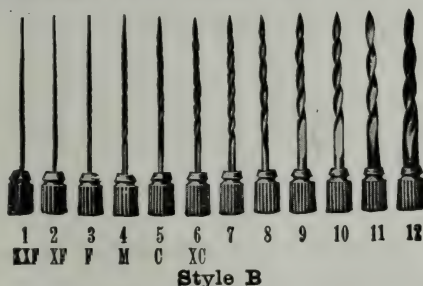
Name

St.

Town

State ..

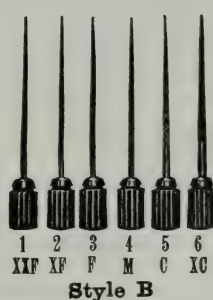
KERR BROACH REAMERS



A spiral with sharp cutting edge tough and flexible. The most efficient method for root-canal treatment and essential for all good canal work.

Twelve graded sizes (1 to 12), Style B as shown, also furnished in Style A for broach holder, Style D (2 $\frac{3}{4}$ in. Aluminum Handle), No. 2 Right Angle and No. 7 Hand Piece.

KERR PULP CANAL FILES



Kerr Pulp Canal Files are small tapering spirals with a fine, sharp file thread cutting edge especially designed for use in connection with the Kerr Broach Reamers.

After having opened up the canal with the Kerr Reamer, the files can be successfully used by rubbing up and down the canal wall or by giving them a turn into the canal and directly withdrawing.

Made in 6 sizes and 3 styles
A, B and D

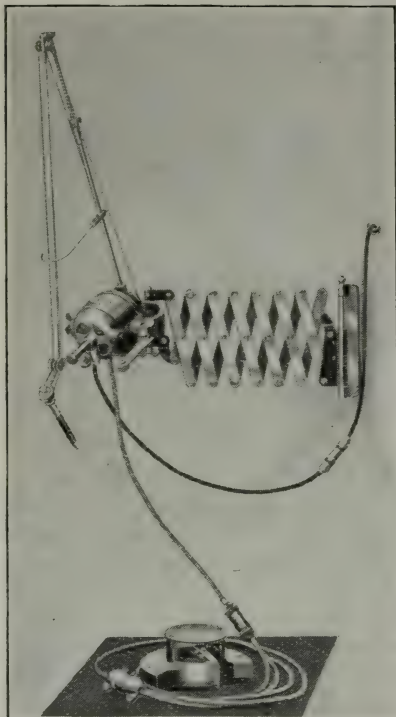
Booklet on Kerr Pulp Canal Instruments sent upon request

Manufactured by DETROIT DENTAL MFG. CO., Detroit, Mich., U.S.A.

Cambridge Dental Engines

Cable Type, \$75.00

All-Cord Type, \$85.00



Easy Payment Plan.

Catalogue on request.

Manufactured and sold by **Sterling Dental Mfg. Co.** 120 Boylston St. Boston, Mass.

"MODELIT"

The New Dental Wax

Ready for Instant Use.
Requires no Heating.
Keeps Moist Indefinitely.
Takes Sharp Impression of Smallest Details.
Holds its Form without Breaking.
Pleasant to use.

Order of your Supply House or sample sent postpaid for 60c by

THE PRANG COMPANY

1922 Calumet Ave.
Chicago

30 Irving Place
New York City

Uneda Tooth Stain Remover

Makes your Tartar and Salivary Calculi easy pickings, Doctor.

Positively removes green, yellow and tobacco stains without injury to the gums or enamel. Absolutely harmless in removing black stains from deciduous teeth.

Our preparation has no equal besides saving you time, labor, and patience.

Regular 6-oz. bottle at your dealer or direct from us, One Dollar.

Samar Dental Specialty Co.

American National Bank Bldg.
NEWARK, N. J., U. S. A.

Samples and Literature on receipt of your professional card, Doctor



Never Hardens in the Tube

The quantitative formula of ALBODON DENTAL CREAM, analytical reports, and sample will be sent on request. Address

The Albodon Co., 7 West 45th St., New York



Dr. Ross's

Antiseptic Local Anaesthetic

WITH COCAIN OR
WITH NOVOCAIN

THE BEST IN
THE WORLD

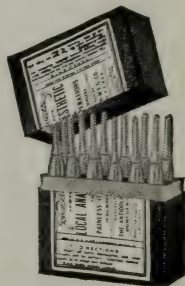
IS A STERILE ISOTONIC SOLUTION

Bacteria cannot live in it, consequently needs no boiling, although Waite's can be boiled with impunity. It has been used in over a billion cases of Surgery, Major, Minor, by Infiltration and Nerve Blocking.

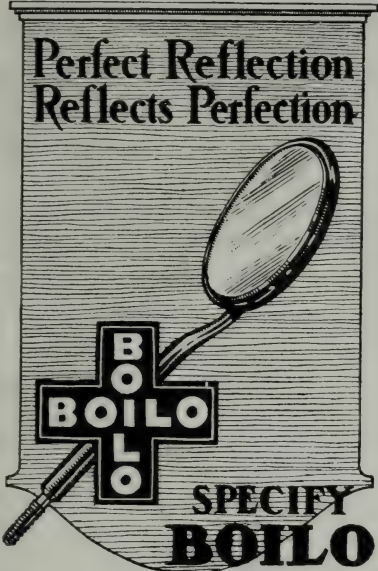
ORDER FROM YOUR DENTAL DEPOT

THE ANTIDOLOR MANUFACTURING CO.

18 Main Street, Springville, N. Y.



Perfect Reflection
Reflects Perfection



BOILO
SPECIFY
BOILO

Post-Operative Congestion

"Probably the most important use for Antiphlogistine in the realm of dentistry, is to reduce the traumatic inflammation which usually follows the extraction of impacted third molars and other teeth. In that field it is almost a specific."

—R. R. J., D.D.S., Chicago



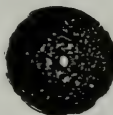
Exit—BRUSH & PUMICE
Enter **BURLEW'S**
CLEANING & POLISHING DISCS



Once you use
BURLEW'S
CLEANING and
POLISHING DISCS

you're going to say to your old brush and pumice—"Well, good-bye, old scouts, your days of spatter are over."

Burlew's Cleaning and Polishing Discs offer the 20th Century method of cleaning teeth and polishing silver fillings and gold inlays, because the necessary cleaning and polishing materials are incorporated into the rubber of the discs themselves. Especially indicated in Rigg's Disease, because they cannot tear and irritate the sensitive gums as a brush will.



PATENTED

They offer you
"The Clean Way to
Clean Teeth Clean"

PRICES

Box of 30 Discs (wheel shape) \$1.00
Box of 20 Discs (cup shape) .. 1.00
Box of 25 Discs (asst. wheel and cup shape) 1.00
For Sale by all Dental Depots

Sole Sales Agents

J. F. JELENKO & CO.

1 Union Square

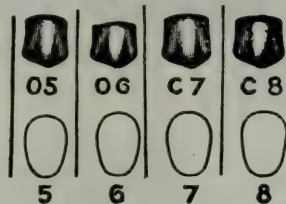
NEW YORK, U. S. A.

DENTISTS SAY LINCROWNS ARE GREAT!

You will say so, too, if you try them

You select LINCROWNS just as you select porcelain teeth. No impression or bite is necessary. You grind and prepare the tooth for the crown. Then you take wire measurement and order the letter and number, the latter being secured by comparison of your wire measure with measurement guide, from which illustration is taken.

The numbers indicate the size of the crown that nearest fits the case. The letters indicate the price and length.



F Crowns	.....	\$1.35
G Crowns	.....	1.15
C Crowns	.....	1.00
O Crowns	.....	.85

Send for complete LINCROWN Booklet

LINCOLN DENTAL MANUFACTURING CO.
1600 Chestnut Street, Phila., Pa.

American X-Ray Laboratories

The kind of service you like.

Single Film . . . \$1.00
Series (10 Films) 5.00

Course of Instruction in Radiography and Diagnosis
beginning January 1 for Dentists.

Complete Course \$100

Splendid opportunity for those desiring complete knowledge in this comparatively new field.

500—5th Ave., cor. 42nd St., First Floor, Room 108

Telephone
5995 Murray Hill

New York, N. Y.

DOCTOR!

when you think of

X-RAY

think of

EDWARDS

when you buy an

X-RAY

buy an

EDWARDS

and be assured of

Service and Satisfaction

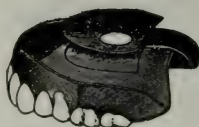
Ask your Dealer or any User

EDWARDS
X-RAY MANUFACTURING CO.

MAIN OFFICE and FACTORY

**10th Street and Fort Wayne Avenue
INDIANAPOLIS, U. S. A.**

14-YEARS



**All Sizes
No Guess Work**

Ago the leading Dental Houses commenced to handle "EUREKA" retainers on account of design and efficiency of attachment, allowing your patients to renew their own cups. Stop experimenting

with those flat cases,—thousands have proven the "EUREKA" to be perfect. Upper or Lower, \$2 per box of six.

EUREKA SUCTION CO., Loudonville, O.

A BOON TO THE SMOKER

To insure clean teeth, a sweet, wholesome breath and improved appetite for breakfast, use—

**Dr. R. B. Waite's
ANTI-PY-O
DENTAL CREAM**

The flavor is delicious with a twang that grips leaving mouth cool & refreshed after using

Retail, 30 cts. a tube
Wholesale, \$2.50 a doz.
AT YOUR DENTAL DEPOT

THE ANTIDOLOR MFG. CO.
18 Main St., Springville, N. Y.

SEND LARGE TUBE FREE

Name.....

Address.....

READING YOUR X-RAY

pictures is made easier by the use of

"Columbia Magnifying Radioscope"

The "explanation window" enables you to explain the diagnosis to your patient by means of a pointer, at the same time as your patient is viewing the magnified Radiograph. With the new Radioscope, Mounts of all sizes including Dental Series of entire mouth can be examined and explained.

Equipped with a rheostat, to vary the amount of light, the model illustrated permits you to examine correctly the thin as well as dense negatives, by simply decreasing or increasing the intensity of light, so as to bring out the finest details.

More than a thousand progressive dentists are using the Columbia Magnifying Radioscope. Your patients, too, will appreciate its great advantages.

Ask your dealer to demonstrate the new instrument.

Cat. 119R as illustrated with light intensity regulator - - \$35.00

Cat. 119L without rheostat - - 25.00

Mounted either on floor stand or wall bracket, additional - \$10.00
These instruments operate from a 110 volt lamp socket.

COLUMBIA X-RAY & ELECTRIC CORP., 131 East 23rd St., New York



Sal Hepatica

Materially

AIDS

Local Treatment In

PYORRHEA

BRISTOL-MYERS

COMPANY

NEW YORK



Polishing and Buffing Motors

for either alternating or direct current, with one

polishing and one buffing attachment and variable speed at

\$20.00

No dentist can afford to be without it.

We make larger motors also. Write for particulars.



\$20.00

FIDELITY ELECTRIC CO., Lancaster, Pa., U. S. A.

POLISHERS



BS
POLISHERS
PAT. AUG. 27, 1918



Made up to a **STANDARD**

Not down to a **PRICE**

Satisfy the **EXACTING** operator

Please the **AESTHETIC** patient

They clean but do not injure the teeth, cut or tear the gums.

Use your Favorite polishing materials. If made into a paste and put inside the cup they will always be right where you want them.

Price, 60c per doz.; \$6.70 per gross

Prices subject to change without notice

The reliable dealers sell them

MADE EXCLUSIVELY BY

YOUNG DENTAL MFG. CO.

St. Louis

Missouri

POLISHERS

MARTIN DEWEY, M.D., D.D.S.
President

H. C. POLLOCK, D.D.S.
Vice-President

The Dewey School of Orthodontia

(NEW YORK COLLEGE OF DENTAL AND ORAL SURGERY)
(POST GRADUATE SCHOOL)

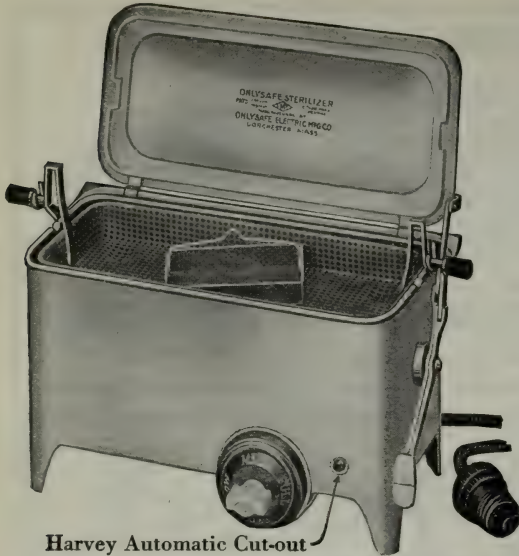
Will hold its next annual session in the City of New York beginning June 21, 1920, to continue through eight weeks of study.

Practically the same course, with some additions, will be given as in years past.

For further information write

Dr. Wm. C. Fisher, Sec'y-Treas.

501 Fifth Ave., New York City



Harvey Automatic Cut-out

WHY NOT BUY INSURANCE?

When you buy an **ONLYSAFE STERILIZER** the Harvey automatic cut-out is your insurance against overheating and possibly fire. If you forget your Sterilizer the cut-out shuts off the current and there are no parts to be replaced in order to reset it.

SIMPLY PUSH A PLUG

and it is ready to work again.

Other features found only in the Onlysafe. Send for illustrated price list and let us tell you about them.

ONLYSAFE ELECTRIC MFG. CO.

1177 Washington St.

Dorchester, Mass.

Old Burs Recut—New Burs

We recut your old burs equal to new at \$2.50 per gross. Facers, reamers, and finishing burs resharpened at 10c each.

Mail orders promptly attended to

National Dental Supply Co.

629 Second Avenue

New York City, N. Y.

Honesty Temporary Stopping

IS EASY TO WORK—EASY TO APPLY

And Your Dealer Will Supply You

ASK HIM TODAY

"It Pays to Use First Quality Materials"

One Box, 40c—6 Boxes, \$1.50—12 Boxes, \$2.75

Made by **FRANK A. REED MFG. CO.**

Dept. C

Beloit, Wis., U. S. A.

Send this add and 12c in stamps for full ounce box as sample

WHY PAY

**22
K**

MORE?

**ROBINSON
GUARANTEED
GOLD SHELLS**

**HIGHLY FINISHED
-THREE LENGTHS**

**NONE
COMPARE
IN PRICE**

**105
DWT**

**NONE
SURPASS
IN VALUE**

"SHELL SIZE CARD"

**22
K**

SENT ON REQUEST

A. ROBINSON & SON

149 Canal Street

New York

**CASH
PAID FOR
OLD GOLD
PLATINUM
&
SILVER**

WE PAY HIGHEST PRICES

We are the Largest Buyers of Scrap
Our Motto: Scrap Back at Our Expense
if remittance is unsatisfactory.

A. ROBINSON & SON

ASSAYERS, REFINERS AND MANU-
FACTURERS OF DENTAL GOLD

149 CANAL STREET NEW YORK

"NIAGARA" 18 SOLDER, .615 FINE
\$15.00 PER OUNCE

Neurocaine

has become well known and
its uses are many

In Pressure Anesthesia.

For the Painless Extirpation
of Pulp.

As a Local Anesthetic in Ex-
traction.

In treating Sensitive Dentine,
and Cavity Preparation, etc.

*Neurocaine being always ready
for use, the busy Dentist will
find it a great time saver,
and to the busy Dentist
TIME IS MONEY.*

One Dollar per bottle
of 100 Billets

May be ordered through Dental
Supply Houses.

Schiffelin & Co.

NEW YORK

CLASSIFIED DEPARTMENT

Reserved for announcements of dentists desiring to buy, sell or exchange offices, or seeking help or positions

Advertisements are placed under this heading at the nominal price of \$2.00 per insertion of 50 words or less; \$3.00 for 75 words or less; additional words at 5 cents each.

All orders must be accompanied by cash.

Forms close on the 10th of the month preceding date of issue.

THE DENTAL COSMOS

Lock Box 1615, Philadelphia

Wanted. A young dentist holding New Jersey licenses to take over the practice of the late Dr. P. J. Syer, Burlington, N. J. For further information address Mrs. P. J. SYER, Burlington, N. J.

Wanted. An experienced woman graduate to specialize in oral prophylaxis and the care of children's teeth. Address "N. E." care The S. S. White Dental Mfg. Co., 7 Union Square, W., New York, N. Y.

Wanted. In Pittsfield, Mass., an experienced dentist. Must be good extractor and crown and bridge man. A good opportunity for the right man. Give age, experience, references, etc., in first letter. P. O. Box 1373, Pittsfield, Mass.

Wanted. Dentist to share offices with a physician. Corner location. Excellent residential and business section. Modern conveniences. North light. Full particulars on application. Dr. LEON FELDERMAN, 4428 York Road, Philadelphia, Pa.

Wanted. Dentist with ethical practice in large Connecticut city desires an assistant. Must be good operator, capable of handling a high-class clientele. Good opportunity for right man. Salary or commission. State age, experience, and salary expected. References required. Address "X. L." care DENTAL COSMOS.

Wanted. A capable and gentlemanly operator at once. Exceptional opportunity in one of best London-England practices. Should be University of Pennsylvania or Michigan graduate—25-30. Experienced. Send particulars and photo. Address "N. V." care C. ASH SONS & Co., Broad Street, Golden Square, London, W. I., England.

Wanted. All-round dentist to take charge of office in Mexico. This office has a practice that for the past ten years has paid \$10,000 to \$12,000 per year. Want a man between the age of twenty-eight and forty years. To a competent man, who will sign contract for one or two years, will pay his traveling expenses both ways and divide the net profit of the office. Address "W. F." care The S. S. White Dental Mfg. Co., 5 Union Square, W., New York, N. Y.

For Sale. A set of Chaves' instruments for removable bridge work. Excellent condition. Price, \$100. Cash only. Address "R. B." care The S. S. White Dental Mfg. Co., 5 Union Square, W., New York, N. Y.

For Sale. Semi-advertising office in central New York. Prosperous manufacturing city of 25,000. Office does \$8500 cash yearly. Modern equipment. Do not answer unless you mean business. MOHAWK DENTAL SUPPLY Co., 414 Arcade Building, Utica, N. Y.

For Sale. Office and practice of nearly \$6000 per year. Best location in town of 3500 population. Cheap rent and small expenses. Unusual opportunity for young dentist. Terms reasonable to quick buyer. Reason—sickness. Address "EASTERN PENNA." care DENTAL COSMOS.

For Sale. \$450 buys complete dental equipment and good location. Electric engine, lathe, cabinet, chair, fountain cuspidor, vulcanizer, etc. Unfinished work turned over to buyer. No opposition. Illinois town; population 1600. Must sacrifice for quick sale. Good country to draw from. Address "M. C. K." care DENTAL COSMOS.

Hygienist. New Haven hospital requires the services of a graduate dental hygienist. Must be experienced and capable of taking charge. Good hours. Interesting work. References required. Apply, stating age, school, experience, and salary (which includes living at hospital) expected, to E. R. BRYANT, D.D.S., 185 Church Street, New Haven, Conn.

Situation Wanted. Recent graduate, registered, desires position part or full time. Excellent references furnished. Will consider out of town. Dr. A. PEPPER, 271 South 4th Avenue, Mount Vernon, N. Y.

Position Wanted. With ethical New York dentist. Nearly five years' experience of the better sort and experience in orthodontia. Can furnish a good record and references. Christian. Address "E. L." care DENTAL COSMOS.

Position Wanted. New York licensed operator desires position with ethical dentist. Especially proficient in prosthetic work and compound technique. Can furnish best of references. Address "R. C. S." care S. G. SUPPLEE & Co., 1 Union Square, New York, N. Y.

Position Wanted. As operator with ethical dentist by a Harvard graduate with three years' experience. Registered in Massachusetts and Connecticut. Address "OPERATOR," care The S. S. White Dental Mfg. Co., 120 Boylston Street, Boston, Mass.

Position Wanted. With ethical New York practitioner, with the object of eventually specializing in prosthesis. Thirteen and one-half years in general practice. Thirty-six years of age. Gentle. Reliable references. Address "PROTHESIS," care DENTAL COSMOS.

Position Wanted. Dentist, registered, New York State license, willing and conscientious, wants position with ethical practitioner. Will go out of town. Best references. Salary secondary. Address "J. S." care The S. S. White Dental Mfg. Co., 7 Union Square, W., New York, N. Y.

Position Wanted. Graduate dentist, lady, of a New York college, year 1916, licensed in both New York and Washington, D. C., is interested in prophylaxis and is desirous of obtaining position with dentist in Washington, D. C., to take care of that part of his practice. Address "G. M." care DENTAL COSMOS.

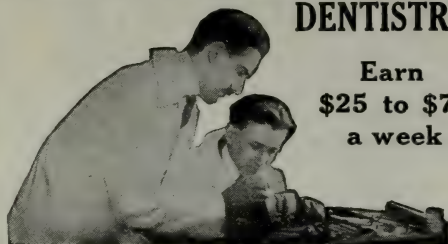
Position Wanted. American, graduate dentist, five years in general practice, two years spent in France, desires position as representative or agent for American manufacturer or jobber. Experience in dental supplies. Would consider England. References furnished. Address "J. V. S." care DENTAL COSMOS.

Position Wanted. As associate operator with ethical practitioner, preferably New York City. D.D.S. University Pennsylvania, D.M.D. Harvard. Eighteen months in France, Captain Dental Corps. Four years' experience. Licensed Pennsylvania, New York, Massachusetts. References. Address "A. B. C." care The S. S. White Dental Mfg. Co., 7 Union Square, New York, N. Y.

Special Attention. If you have a practice for sale, or seek a location or position for a dentist, physician, veterinarian, or nurse, write to me. I also negotiate purchase and sale of drug stores and locate drug-store operatives in any capacity. Assts. nurses, etc., furnished dentists. Address F. V. KNIEST, R. P., "Bee" Building, Omaha, Nebraska.

Dental Salesman. Nineteen years' experience in the New England field, consisting of inside, college, and road work. At present serving as buyer and assistant manager. Desires to renew road work in a larger way and would correspond with three or four live, non-conflicting specialty lines, with a view of acting as detail and sales agent for New England. First-class references. Address "L. A. C." care DENTAL COSMOS.

LEARN MECHANICAL DENTISTRY



Earn
\$25 to \$75
a week

We teach Mechanical Dentistry by actual practice in our well-equipped laboratories. Instruction is given under the direction of Prof. Geo. A. Bodee, whose work is recognized throughout America as the standard of excellence. Day or evening courses, easy payments. No book study, just practical work. No previous experience required.

Established Over 27 Years

Owing to our recognized ability and long experience, our graduates are in great demand.

Dentists are privileged to take any part of our course

Write for Free Booklet

It tells all about our course of instruction and the exceptional positions open to graduates. Ask for bulletin No. 55.

Our Bureau of Employment Will Furnish Competent Mechanical Dentists Without Charge. **Dentists**—Send us your mechanical work. We have one of the most thoroughly equipped laboratories in America and guarantee satisfaction on any work that you may entrust to us.

BODEE SCHOOLS OF MECHANICAL DENTISTRY

NEW YORK
15 W. 44th St.

PHILADELPHIA
15th and Walnut Sts.

BROOKLYN
15 Flatbush Ave.

DR. J. G. WILSON'S LOCAL ANAESTHETIC (Containing Cocaine) NOCOC LOCAL ANAESTHETIC (Containing Novocain)

**Absolutely Safe Thoroughly Efficient
Always to be Depended Upon**

\$.60 per oz.; 6 ozs. \$3.00; 24 ozs. \$9.60
\$.75 per box (12 ampules); 24 boxes \$12.00

Order of your Dealer

CENTRAL CHEMICAL CO.
304 Main Street Springville, N. Y.

Telephone Vanderbilt 2269

Radiodontia Exclusively

The Federal X-Ray Co., Inc.

50 East 42d Street, Suite 701-702

New York, N. Y.

Hours 9 a.m. to 5 p.m. Saturdays 9 a.m. to 1 p.m.

TULANE UNIVERSITY OF LOUISIANA

College of Medicine

SCHOOL OF DENTISTRY

NEW ORLEANS, the metropolis of the South, offers unlimited clinical material, complete educational facilities, and delightful winter climate, etc. The Faculty has been re-organized, and the curriculum revised to conform with modern methods. The Infirmary has been entirely remodelled, renovated, and equipped with the latest facilities for teaching advanced methods in every department.

Dentistry is taught by Lectures, Demonstrations, and Infirmary Practice—Women Admitted

Members National Association of Dental Faculties

For further information and announcement, address

Next session begins Sept. 30th, 1918

WALLACE WOOD, Jr., D.D.S., Dean

Hutchinson Memorial, 1551 Canal St.

New Orleans, Louisiana

ORTHODONTIA

DR. EDWARD H. ANGLE WILL RECEIVE A LIMITED NUMBER OF STUDENTS FOR PRIVATE INSTRUCTION IN ORTHODONTIA. RECENT GRADUATES OF MEDICAL OR DENTAL COLLEGES PREFERRED. ONLY THOSE WHO ARE WELL GROUNDED IN THE FUNDAMENTS OF THE SCIENCE,—HISTOLOGY, ANATOMY, PHYSIOLOGY, DYNAMICS, ART, ETC., WILL BE CONSIDERED.

1025 N. MADISON AVE., PASADENA, CALIFORNIA

The Baltimore College of Dental Surgery

THE OLDEST
DENTAL
COLLEGE IN
THE WORLD

Chartered by the Legislature of Maryland in 1839

The New College Building purchased by the Faculty and opened June 1st, 1914, is located at 851 N. Howard Street

The Baltimore College of Dental Surgery, the first and for many years the only dental school, offers facilities for the study of dentistry proper, such as age and experience only can give. Its immense museum, complete apparatus, large and well-arranged building and carefully studied curriculum, give to its students great advantages and opportunities, both theoretical and practical, while its age gives its diploma a dignity far outranking all other colleges,—a diploma honorably represented in all civilized countries, and held by the most distinguished members of the dental profession.

The fact that dentistry must be practically taught is fully recognized, the College Infirmary, a most complete, large and handsome hall, being daily filled with clean and respectable patients, of class nearly equal to those of the average dentist. The infirmary is open

all the year. For Summer Session, no charge to those who attend the following Winter Session.

The session begins October 1st. A large corps of demonstrators, always present, put in actual practice the teachings of all lecturers in dentistry, leaving nothing undemonstrated. All methods are fully taught, all appliances and apparatus used; the making of instruments and the most elaborate gold and continuous-gum work, and all the cases arising in ordinary practice, with many which are rarely seen, carefully demonstrated.

The College has formed an alliance with the College of Physicians and Surgeons by which its students are privileged to attend all lectures and clinics.

The qualifications for entering the first year's course are in accordance with the resolution adopted by the National Association of Dental Faculties, National Association of Dental Examiners and the Educational Council of America.

Graduates in Medicine can enter the Second-year Class.

FEES.—Matriculation (paid once only), \$5.00. Tuition fee, \$150.00. Diploma fee, \$30.00. Dissecting fee (paid once only), \$10.00.

Students corresponding with the Dean will be careful to give full address and direct their letters to
W. G. FOSTER, D.D.S., Dean **No. 851 N. Howard St., Baltimore, Md.**

TEMPLE UNIVERSITY DENTAL SCHOOL Philadelphia Dental College 18th and Buttonwood Streets, Philadelphia, Pa.

RUSSELL H. CONWELL, D.D., LL.D., President

I. N. BROOMELL, D.D.S., Dean

Located in a section of Philadelphia not far from its center and in close proximity to the United States Mint, Carnegie Library and Fairmount Park, with buildings specially designed and equipped for its purposes this institution offers many advantages to those desiring to prepare themselves for the practice of Dentistry.

Instruction is provided through didactic lectures, laboratory work, technic training and infirmary practice under skilled supervision.

Course for the degree of D.D.S. covers four years, each term beginning the last Monday in September and ending June 1st of the following year.

Announcements and full information may be obtained by addressing

DR. I. N. BROOMELL, Dean

North Pacific College of Dentistry

Portland, Oregon



The object of North Pacific College is the training of young men and women for successful professional careers. It may safely be said that no school in America has better facilities.

The new fireproof building is one of the best lighted buildings on the Pacific Coast.

The new Hospital for patients requiring Oral Surgery and work for the correction of deformities is open to the public. Thousands of patients are treated annually in the Infirmary and Hospital, which offer exceptional opportunities to ambitious students.

Applicants for admission are required to present evidence of having received preliminary training equivalent to grad-

uation from an accredited four-year high-school or academy, or not less than fifteen units (thirty credits). No conditions on the foregoing entrance requirements are allowed.

The annual session begins September 28.

For detailed information and illustrated catalog address

THE REGISTRAR East Sixth and Oregon Streets PORTLAND, OREGON

More Than A School

A System of Personal Instruction

To A Limited Number

A GENERAL COURSE IN MODERN DENTISTRY

Comprising—Removable and Stationary Crown and Bridge Work, Root Canal Work, Dental X-Ray, Pyorrhea Treatment, Conductive Anesthesia, also General Anesthesia, Extraction, Modern Plate Work and Impression Taking.

Patients are in Excess of Requirements

WE CAN MAKE YOUR TIME CONVENIENT TO US

THE POST GRADUATE SCHOOL OF DENTISTRY OF PHILADELPHIA

ALBERT W. JARMAN, D.D.S.

527 Fifth Ave., New York

Cor. Chestnut and 19th Streets, Philadelphia, Pa.

New York College of Dentistry

1919-1920—54th Collegiate Year

Infirmary Course

June 19 to September 27, 1919

(Optional)

Lecture Session

Begins about October 1, 1919

(Obligatory)

For information regarding admission, preliminary educational requirements, curriculum, etc., write for an announcement

Clinical Post Graduate Courses in (1) Diseases of the Mouth, including Oral Surgery and the making of Nasal and Aural Moulages; the use of General and Local Anaesthesia and the Interpretation of Radiographs; and (2) Exodontia, including General and Local Anaesthesia will be given during the summer months. These courses will be of four weeks' duration and may be taken singly or collectively. The first course will begin on or about June 16, 1919.

For Particulars apply to the Dean

New York College of Dentistry

205-207-209-211-213 East 23d Street, New York, N. Y.

Chicago College of Dental Surgery

DENTAL DEPARTMENT VALPARAISO UNIVERSITY



Is the result of over

THIRTY-FIVE

YEARS

of steady development

The Next Annual Course of
Instruction will begin the
First Tuesday in October

Located in the center of the greatest College and Hospital district in the world, with unlimited clinical facilities, it offers every needed opportunity to the Dental Student.

For Catalog giving details, address

TRUMAN W. BROPHY, Dean

1747 W. Harrison St.

CHICAGO, ILL.

College of Dental and Oral Surgery of New York

302-304-306 East 35th Street

CO-EDUCATIONAL

SESSION 1919-1920 BEGINS OCTOBER 1919

The curriculum comprises a four years' course of thorough instruction in all forms of Modern Dentistry.

For catalogue and other information, address

College of Dental and Oral Surgery, 302 East 35th St., New York

WILLIAM CARR, A.M., M.D., D.D.S., Dean

Harvard University Dental School

Four-Year Course

Fifty-second Year Begins September 22, 1919

New Building

Large Clinic

Modern Equipment

Dr. Eugene H. Smith, *Dean* *Longwood Avenue, Boston, Mass.*

VANDERBILT UNIVERSITY

SCHOOL OF DENTISTRY, NASHVILLE

BEAUTIFUL CAMPUS

MODERN BUILDINGS

AMPLE EQUIPMENT

The Forty-first Session Opens September 30, 1919

The Four Year's Course, leading to the degree of Doctor of Dental Surgery, embraces all that modern dentistry demands

FOR BULLETINS AND INFORMATION, ADDRESS

DR. R. BOYD BOGLE, *Dean*

Hitchcock Bldg., Nashville, Tenn.



University of Buffalo College of Dentistry

FALL session begins September 29th. The Faculty would announce the opening of the new Clinic of Oral Surgery, which will occupy the west side of the fourth floor of the building, and is handsomely equipped throughout. It is the gift of Dr. Victor Hugo Jackson of New York City, and will hereafter bear his name.

For catalog, address

Dr. Daniel H. Squire, Dean
25 Goodrich Street, Buffalo, New York

Graduate School of Orthodontia
of the
Harvard University Dental School
and
The Forsyth Dental Infirmary for Children

Arrangements have been made between Harvard University and The Forsyth Dental Infirmary for Children for the organization and conduct of a Graduate School of Orthodontia.

The teaching staff will embrace men eminent in Orthodontia and collateral subjects. The clinical opportunities of the Harvard Dental School and The Forsyth Dental Infirmary are unexcelled.

The opening date has been postponed until January 5, 1920.

For further particulars address

DR. ALFRED PAUL ROGERS, DEAN

Harvard-Forsyth Post-Graduate School of Orthodontia
520 BEACON STREET BOSTON, MASS.

University of Maryland

DENTAL DEPARTMENT

THE regular Winter Session commences on October 1st of each year and ends in the following May.

The Annual Catalogue contains Courses of Study, etc. Attendance upon four regular winter sessions will be required before the final examination for the Degree of doctor of Dental Surgery.

Any candidate who may fail to pass the final examinations in April will have the privilege of a second examination in the following October without further attendance at a regular session. Graduates of medicine and those who have attended a recognized dental school for one or more sessions are admitted to higher grades on entering this school. The requirements for admission are the same as in all reputable dental colleges and according to the rules of the National Association of Dental Faculties.

FEES.—Matriculation fee (paid once only), \$5; Tuition fee, \$150; Diploma fee, \$30; Dissecting fee (paid once only), \$10.

For information and catalogue, address

T. O. HEATWOLE, M. D., D. D. S., Dean
N. E. COR. LOMBARD AND GREENE STREETS BALTIMORE, MD.

*The Thomas W. Evans
Museum and Dental Institute
School of Dentistry
University of Pennsylvania*

The largest and most completely equipped dental educational institution in existence for the training of students for the practice of dentistry.

The course is graded and extends through four annual sessions, beginning the last Friday in September and ending the third Wednesday in June of each year. Every feature of practical value to the prospective practitioner is taught by a competent faculty aided by an efficient corps of demonstrators. It is the aim of the Institute to so conduct its educational work that those who pursue its courses leading to the Degree of Doctor of Dental Surgery shall be thoroughly grounded in the scientific principles upon which an intelligent and skillful practice of dentistry is based. A superabundance of clinical patients affords ample opportunity for the practical training of the students in all classes of dental operations.

The laboratories and operatorium are unsurpassed in equipment. The Institute is provided with every facility of the most modern and perfect type for laboratory work in connection with every department of dental instruction as well as for advanced scientific research.

A separate department for post-graduate instruction is provided wherein practitioners and special students are offered opportunity and facilities for training in the latest developments of dental science and art.

Catalogs and circulars giving detailed information furnished upon application. Address Dr. Charles R. Turner, Dean, The Thomas W. Evans Museum and Dental Institute, Fortieth and Spruce Streets, Philadelphia.

All the Good Qualities in Every Package



S. S. White Zinc Cement

is smooth and plastic in the mix, adhesive and non-porous. It sets rapidly but with a gradual reaction, purposely modified to prevent an excessive and painful rise in temperature. No bismuth or sodium is employed in the production of the cement for very important reasons described in a booklet which we will be pleased to send you.

Six Colors and Three Settings

1 oz. Package (any color)	\$2.00
6 ozs. in Carton	10.00
6 ozs. in Mahogany Cabinet	10.75

(Six-ounce packages contain six full ounce bottles cement powder, any colors; six bottles cement liquid, and three dropper caps)

YOUR DEALER WILL SUPPLY YOU

The S. S. White Dental Mfg. Co.

"Since 1844 the Standard"

Philadelphia

